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Oil and gas resources, Jackson County, Missouri

Joseph Robinson Clair

OIL AND GAS RESOURCES
JACKSON COUNTY, MISSOURI

BY

JOSEPH ROBINSON CLAIR

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THESIS

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Approved by Garrett A. Muilenburg
Professor of Geology

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INTRODUCTION

The oil and gas production in Jackson County, though rather small, is nevertheless of considerable economic importance. A portion of the county has been rather thoroughly developed but the remainder has had little prospecting. In order to aid further development in the region the Missouri Geological Survey engaged in the mapping of all the known wells in the county as a basis for preparing a structural contour map of the area. In addition, a member of the Survey staff is stationed permanently in Kansas City to give assistance to the operators in the region and to collect the logs of all wells drilled. The following report is presented as a means of placing before these operators all the information available in the county and to indicate possibilities for further development.

In working out the subsurface structure shown on the accompanying maps (Plates I and II) logs of some 1500 wells were used. A few of these are included in detail in the appendix of this report together with a tabulation showing the data for each well used. Each one is tabulated as to: (1) map number of well, (2) company or owner, (3) farm, (4) location, (5) surface elevation, (6) total depth, (7) depth to top of Bethany Falls limestone, (8) elevation top of Bethany Falls limestone, (9) depth to base of Lexington coal "Cap Rock",

(10) elevation base of Lexington coal "Cap Rock", and (11) type of well. The logs of all the wells are on file in the offices of the Missouri Geological Survey and Water Resources, at Rolla, Missouri. Supplementing the maps are geologic structure sections along the lines A-A, B-B, and C-C as shown on Plates I and II. These show in detail the rather sharp arching under the more pronounced structural features and the rather gentle attitude of the beds in the broader anticlinal and synclinal areas.

Acknowledgments

The writer wishes to express his indebtedness to Dr. H. A. Buehler, State Geologist, who made this investigation possible; to Mr. H. S. McQueen, who has given many valuable suggestions; and to Mr. F. C. Greene, under whose direction the field work was successfully completed, for his able assistance. Logs, samples, and other information were supplied by many drillers and operators in the county and to each one of these the writer acknowledges his whole-hearted appreciation.

The following individuals contributed valuable time and statistics: Mr. Mort White, Lees Summit Gas Company; Mr. Rufus F. Smith, Panhandle Eastern Pipe Line Company; Messrs. Dave and Nester Judd, J. D. Judd and Son, Martin City, Missouri; Mr. George V. Hassinger, Interstate Gas Company, Harrisonville, Missouri; Mr. F. E. Davis, Missouri Valley Gas and Oil Company; and Dr. Glenn G. Bartle, Department of Geology, University of Kansas City, Kansas City, Missouri.

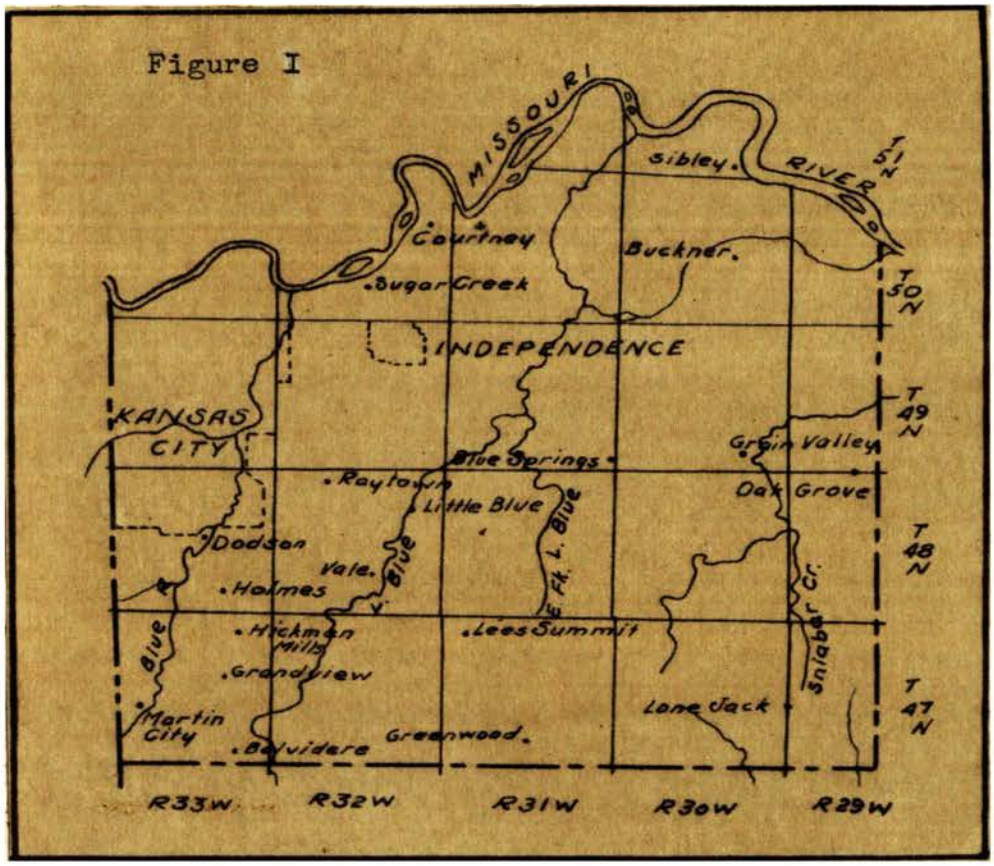
The writer wishes to thank Miss Mary Hundhausen and Mr. C. E. Prouty for aid in identification of heavy minerals in residues; Mr. Earl McCracken for carefully checking several deep well logs included in this report and all other members of the Survey staff who have helped in various ways. The writer was assisted in the field by Mr. K. D. Cox and Mr. Don Scroggins

served as draftsman.

In working up the material for this report many valuable suggestions have been made by members of the Department of Geology at the Missouri School of Mines and the writer is deeply indebted to Dr. G. A. Muilenburg who read the entire manuscript and made many helpful suggestions as to arrangement of material and clearness of phraseology.

Location

Jackson County is situated in the northwest corner of that portion of the state which lies south of the Missouri River. The county has an area of approximately 607 square miles or 388,480 acres. It comprises the townships and ranges as shown on the following sketch map.



Physiography

Physiographically, Jackson County is located in the "Scarped Plains", [1] which is the prairie area lying between the Ozark Plateau and the Great Plains. The rocks of the region dip gently northwest away from the Ozark uplift. They consist of alternately weak and resistant beds, the erosion of which has produced a series of plains and escarpments striking generally in a northeast and southwest direction. The relief is essentially like that of all other areas in the Missouri Valley where the surface has not been modified by glaciation. In all of these the general surface is a rolling upland with a typical dendritic drainage system.

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1. Marbut, C. F., Physical Features of Missouri, Mo. G. S., Vol. 10, p. 14-109, 1896.

Topography

The main divide, which spearates and controls the direction of drainage in Jackson County, lies along the southern border of the county; streams flowing north empty into the Missouri River and those flowing south, into the Osage. The divide is narrow in the eastern part of the county near Hicks City and Lone Jack but to the west, in the vicinity of Lees Summit it widens considerably. The region along the crest of this main divide is for the most part open prairie country devoted chiefly to farming and cattle raising.

Extending to the north from the main divide are smaller divides. They are capped for the most part by members of the Kansas City formation, and finger out in the wooded ridges, separating the smaller valleys of the dendritic drainage system. The divide west of the Big Blue River lies chiefly in Kansas, but enters the county near the southwest corner of Kansas City and extends to the bluffs along the northern boundary, broken only by the old glacial valley of the Kansas River which crosses the city.

The divide between Big and Little Blue Rivers extends uninterruptedly across the county, in a direction slightly east of north. It terminates on the north at Cement City in precipitous bluffs nearly 300 feet high. In pre-glacial time it

probably extended on eastward to Sibley, but it is now interrupted by the valley of the Little Blue River. The upland region between Lake City and Atherton is cut by the pre-glacial valley of the Kansas River and this region is an upland today due to the filling of this ancient valley with debris from the melting ice sheet.[2]

The divide between Little Blue River and East Fork of Little Blue River includes all of the flat farming land to the north, east and south of Lees Summit. It is characterized, especially in the northern part, by long finger-like ridges capped by the Winterset and Bethany Falls limestone members of the Kansas City formation.

The most easterly divide extends north from the main divide between East Fork of Little Blue River and Sni-A-Bar Creek. It curves in a northeasterly direction and the wooded ridges into which it branches on the east near Sni Mills and Oak Grove, form the roughest portion of Jackson County and are known locally as the "Sni-A-Bar Hills"*

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2. Clair, J. R. and Greene, F. C., An Undescribed pre-glacial valley in northwest Jackson County, Missouri: (Abst) Proc. Missouri Acad. Sci. vol 3, no. 4, p. 130, Sept. 1937.

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* There is now available a complete set of detailed topographic maps of Jackson County on a scale of 1/24,000 with a contour interval of 10 feet. Sixteen sheets comprise the set.

Bethany Falls Escarpment:

The most distinctive topographic feature in the county is the Bethany Falls escarpment. It is exposed along the courses of the main streams and is found progressively higher in elevation from west to east across the region. The Bethany Falls limestone has an average uniform thickness of twenty feet which is commonly exposed in a low cliff and can be traced in an almost continuous outcrop for many miles within the limits of the county. The Bethany Falls is a massive, very pure limestone, with a prominent vertical joint system. Underlying it is a soft fissile shale that weathers easily. The undercutting, by weathering of this shale coupled with solution along the vertical joint system of the limestone, causes large blocks to become detached from the parent ledge and slide down the slope, furnishing one of the most characteristic features of the escarpment.

In the eastern part of the county there is a secondary plain extending away from the foot of the Bethany Falls escarpment. It has been formed by the comparatively rapid erosion of the soft Pleasanton shales and lies approximately 100 feet below the ridge areas. The plain is narrow in the southeast part of the county but widens rapidly north of Oak Grove. Its surface is gently rolling essentially like that of the upland plain.

Plate IX

Bethany Falls Escarpment
SE of Independence

Drainage

The Missouri River is the master stream of the region receiving the entire drainage of the county either directly or indirectly. All of the area north of the main divide, extending east and west along the south border of the county, drains directly into the master stream. The drainage from the remaining part, about 55 square miles, is carried to the south through Big Prairie and Crawford Creeks into the Grand River, a tributary of the Osage, and are indirect affluents of the Missouri River.

The larger streams in Jackson County are Blue or Big Blue and Little Blue Rivers, Fire Prairie and Sni-A-Bar Creeks. These, with their tributaries, Indian Creek, Brush Creek, Round Grove Creek, East Fork of Little Blue River and West Fork of Sni-A-Bar Creek, make up the principal drainage system of the county. The Kaw River with a small tributary, Turkey Creek, touches the western edge at Kansas City. Rock Creek, Sugar Creek and Mill Creek near Independence, Sleepy Branch Creek near Atherton and Sugar Creek between Atherton and Sibley are all minor affluents of the Missouri.

The Big Blue River drains the western part of the county, Little Blue River the middle and Sni-A-Bar Creek the easternmost portion. The northeast corner, including the old valley of the Little Blue and Kansas Rivers between Lake City

Plate X

A Typical Stream
Indian Creek
South of Kansas City

and the Missouri River, are drained by Prairie and Fire Prairie Creeks.

The banks of all the streams are relatively high and steep and their channels are deep with rapids at widely separated intervals. Comparatively wide flood plains on which numerous and often intricate meanders have been developed flank them.

Sni-A-Bar Creek has the steepest gradient of any of the streams in the county, dropping 250 feet in about three miles. In a remarkably short distance, however, it too develops a wide flood plain, through which it meanders to the Missouri.

Highways

Jackson County has approximately thirteen hundred miles of county highways. From 1928 to 1933 a primary road system, consisting of over three hundred miles of concrete slab and other all-weather types of pavement, was constructed. This system is adequate to care for extensive rural, residential, agricultural and industrial development and was so planned that no point in the county is more than two miles from these all-weather roads. In addition to this there are nearly 1000 miles of secondary highways which consist principally of oiled earth and subordinately of macadam.

This excellently planned highway system has been of great aid in the development of the oil and gas resources of the county, for it has made areas otherwise inaccessible, easily reached by field parties and has permitted easy and rapid movement of drill rigs and equipment.

STRATIGRAPHY

General Relations

In Jackson County the outcropping formations and those penetrated by comparatively shallow wells are all of Pennsylvanian age. The Pennsylvanian series in Missouri is represented by about 1900 feet of sediments, but subsequent erosion of these beds in Jackson County has left only the lower portion, with a total thickness of 850 to 900 feet.

The Ozark uplift in the southeastern part of the state raised the whole region and subsequent erosion has exposed the older formations at the center of the uplift. The younger beds now outcrop in an elliptical band around these older beds. The regional dip is outward and hence successively younger formations are exposed at the surface with progressive distance from the uplift. The dip in Jackson County is to the northwest.

The formations exposed and penetrated by wells in this area are shown in the accompanying columnar section. These have been described in detail in previous publications on this area and it is not the purpose of this writer to attempt further description.

The nomenclature used here is that which is best known and most used by the operators in the region, but it does not agree entirely with the recent reclassification of the

Plate XI

COLUMNAR SECTION

SERIES	GROUP	FORMATION	MEMBER	SECTION	THICKNESS	DESCRIPTION OF ROCK
Pleistocene to Recent					10'-100'	Drift, Loess, Clay, etc
PENNSYLVANIAN	MISSOURI	KANSAS CITY LANSING	Plattsburg Ls		5'-7'	Limestone, Gray to Yellow. Fine Grained. Thin-Bedded. Fossiliferous.
			Lane Shale		40'-65'	Sandy Shale and Massive Gray to Yellow Sand. Contains Thin Persistent Limestone. Shale Greenish Gray.
			Upper Farley Ls			
			Lower Farley Ls			
			Iola Ls		15'-43'	Gray to Buff Crystalline Ls Locally Contains Considerable Chert. Weathers in thin wavy Beds.
			Chanute Shale		7'-25'	Gray to Blue Shale, Weathered Brownish. Contains Flattened Concretions
			Raytown Ls		4'-7'	Limestone, Fine-Grained, Mottled
					8'-25'	Shale, Red, Green, Yellow, Buff, Black Slate, Thin Limestone
			Cement City Ls		4'-13'	Limestone Drab to Blue. Weathered deep Yellow
					9'-12'	Greenish to Bluish Shale Above Yellow Below - Thin lenses of Nodular Ls
			Drum Ls.		6'-20'	Limestone, Lower Portion Fine Grained Gray Weathers Buff Upper Portion Gray Finely Oolitic Cross-Bedded
			Cherryvale Shale		20'-33'	Shale, Gray-Bluish to Dark, Thin Fossiliferous Limestone (Block Ls.)
			Winterset Ls.		25'-35'	Limestone, Course to Finely Crystalline Upper part (12'-15') Separated From Lower by 2'-3' Shale Bluish Weathers Gray. Upper Portion Black to Blue Chert
			Galesburg Sh		4'-10'	Shale, Gray to Black, Slaty, Fissile, Clayey
			Bethany Falls Ls		15'-25'	Limestone Lower Gray Crystalline Weathering Along Irregular Vertical Joints - Middle Mottled Gray - Top Mass Poorly Cemented. (Datum See Map I.)
			Ladore Sh.		6'-25'	Shale Gray to Black, Slaty, Contains thin Persistent
			Hertha Ls		3'-18'	Limestone, Gray Weathers Deep Reddish Brown
		PLEASANTON			3'-5' 0-1'	Shale, Gray, Green, Dark Limestone
					25'-30'	Shale, Argillaceous, Sandy, often Massive, Cross-Bedded Sandstone, (Irregular Phase of Knobtown Ss)
			Knobtown Sandstone		2'-12'	Sand, Generally Calcareous at top
					10'-90'	Shale, Argillaceous, Sandy, Sandstone
					0'-3'	Limestone or dark Calcareous Shale,
					3'-5'	Shale Greenish or Gray.
			Wayside Sandstone (of Drillers)		6'-12'	Sandstone
					6'-10'	Shale, Red, Green, Black.
					0'-2'	(Dawson Coal Horizon)
					0'-1'	Shale, Red or Green
					0'-1'	Sandstone, Channels down at Base,
					3'-10'	Locally 100'+ Thick.
			Warrensburg Channel Sandstone		6'-184'	Shale, Gray, Red, Green, Generally
					10'-30'	Present only When Sandstone is Thin
		HENRIETTA	Warland Ls.		0'-1'	Limestone, Gray, Weathered Buff. Two Beds
			Mulberry Coal		2'	Separated By Gray Fossiliferous, Calcareous
			Pawnee Ls.		4'-8'	Shale. Shale Black Carbonaceous. Limestone,
					3'	Light Gray, Dense, Contains Chaetetes
			Peru Sand (of Drillers)		15'-29'	and other Corals, in Two Beds Sandstone and Shale, Red, Green, Black.
			Lexington "cap rock"		5'-7'	Limestone, Brown Thin Persistent (Datum Bed
			Lexington Coal Hor.		c.10"-2'	(Map II)
					2'-4'	Shale, and Black Slate Very little Coal under Clay
			Upper Fort Scott Ls.		2'-4'	Limestone, Gray to Blue, Thick-Bedded,
					19'-21'	Fossiliferous. Sometimes Sandy
						Shale, Red Drab, Blue Black. Sometimes Sandy
			Rhomboidal Ls.		1'-2'	Limestone, One-Bed, Blue Pyritiferous, Hard Shelly
			Summit Coal		c. 1'	Shale, Black to Dark Bituminous, Fossiliferous, Shale
			Lower Fort Scott		2'-5'	Drab, Nodular. Limestone Two-Beds, Green to Gray Fossiliferous
			Mulky Coal		c.1'-2'	Thin or Absent
			Lagonda Shale			Sandstone, Shale, May be either or Both - Locally up to 100' of Sand. Contains Black Shale and Sometimes has one or More Thin Limes Near Base, Particularly where sand is Thin or Absent.
			Squirrel Sandstone		60'-100'	
	DES MOINES	CHEROKEE	Bevier Coal			
			Ardmore Ls.		3'-10'	Limestone in One to Three Beds.
					5'-70'	
			Burbank Shoestring Sand		0-70'	Sand, Shoestring Deposit in T.48 & 49 N. R.32 W. Irregular
			So-Called Bartlesville		10'-40'	Shale, Sandy Shale, Sandstone, Locally Black Shales and Thin Limestones
			Burgess. Sandstone (Clear Creek of Vernon Co. or nearest True Bartlesville)		30'-70'	Sandstone - Abundant Salt Water.

Mississippian Limestone

Vertical Scale 1 Inch = 50 Feet.

Pennsylvanian of the Mid-Continent region by Moore.[3] The following correlation table shows the differences:

FIGURE II

CORRELATION TABLE

	Moores' Reclassification		This Report			
Missouri Series	Lansing Fm.	Merriam Ls. - L. Plattsburg	Plattsburg Ls.	Lansing Fm.	Kansas City Fm.	Missouri Series
	Kansas City Fm.	Bonner Springs Sh.	Lane Sh. / U. Farley Ls. / L. Farley Ls.			
		Wyandotte Ls. / Farley Ls. / Island Creek Sh. / Argentine Ls. / Quindaro Sh. / Frisbie Ls.	Iola Ls.			
		Lane Sh.	Chanute Sh. / Raytown Ls. / Cement City Ls.			
		Iola Ls. / Raytown Ls. / Muncie Creek Sh. / Paola Ls.				
		Chanute Sh.				
		Drum Ls. / Corbin City Ls. / Cement City Ls.	Drum Ls.			
		Quivera Sh.	Cherryvale Sh. / Block Ls.			
		Westerville Ls.				
		Wea Sh. / Block Ls. / Fontana Sh.				
	Bronson Fm.	Dennis Ls. / Winterset Ls. / Stark Sh. / Canville Ls.	Winterset Ls.			
		Galesburg Sh.	Galesburg Sh.			
		Swope Ls. / Bethany Falls Ls. / Hushpuckney Sh. / Middle Creek Ls.	Bethany Falls Ls.			
		Ladore Sh.	Ladore Sh. / Middle Creek Ls.			
		Sniabar Ls.	Hertha Ls.			
	Bourbon Fm.	Warrensburg Channel Sand	Knobtown Sand / Wayside Sand (of drillers) / Warrensburg Channel Sand	Pleasanton Fm.		
Des Moines Series	Marmaton Fm.	Nowata Sh. / Altamont Ls.	Absent			
		Bandera Sh. / Worland Ls. / Mulberry Coal	Worland Ls. / U. L. / Mulberry Coal	Henrietta Fm.		Des Moines Series
		Pawnee Ls.	Pawnee Ls.			
		Labette Sh. / Lexington "Cap Rock" / Lexington Coal	Peru Sand (of drillers) / Lexington "Cap Rock" / Lexington Coal			
		Fort Scott Ls. / Summit Coal	U. Fort Scott Ls. / Rhomboidal Ls. / L. Fort Scott Ls. / Summit Coal			
	Cherokee Fm.	Mulky Coal / Bevier Coal / Aromore Ls. / Tebo Coal / Jordan Coal	Mulky Coal / Lagonda Sh. / Squirrel Sand Zone / Bevier Coal / Aromore Ls. / Burgan Sand (Irregular) / So-called Bartlesville Sand / Burgess Sand	Cherokee Fm.		

3. Moore, R. C., A reclassification of the Pennsylvanian system in the Northern Mid-Continent region; The Kansas Geol. Soc., Guide Book, 6th Ann. Field Conference, pp 79-98, 1932

Surface Formations

The outcropping formations range from the lower portion of the Plattsburg limestone of the Lansing to the upper Fort Scott limestone of the Henrietta. They will be discussed briefly in descending order.

Lansing Formation:

This formation outcrops in a very limited area in parts of secs. 16, 17, 18, 19, 20 and 21, T. 49 N., R. 33 W., where it has been preserved in a structural sink which has protected it from complete removal. Only the lower 5 to 7 feet of the Plattsburg limestone remains, but the underlying Lane shale is well exposed. The interval between the lower Farley limestone member of the Lane shale and the top of the Iola limestone member of the Kansas City formation, however, is much thinner than normal. The formation here has a maximum thickness of sixty-five feet.

Kansas City Formation:

The detail of the nine members of this formation is adequately shown in the columnar section. They outcrop over practically the entire county and are readily distinguishable. The Bethany Falls limestone member, because of its widespread distribution, was adopted as the datum bed for one of the structural contour maps of this report (See Plate 1). The formation has a uniform thickness of about 250 feet.

Plate XII A

Iola Escarpment
Penn Valley Park, Kansas City, Mo.

Plate XII B

Cut in Iola Limestone
SE part of Independence, Mo.
on Missouri Pacific Railroad

Plate XIII

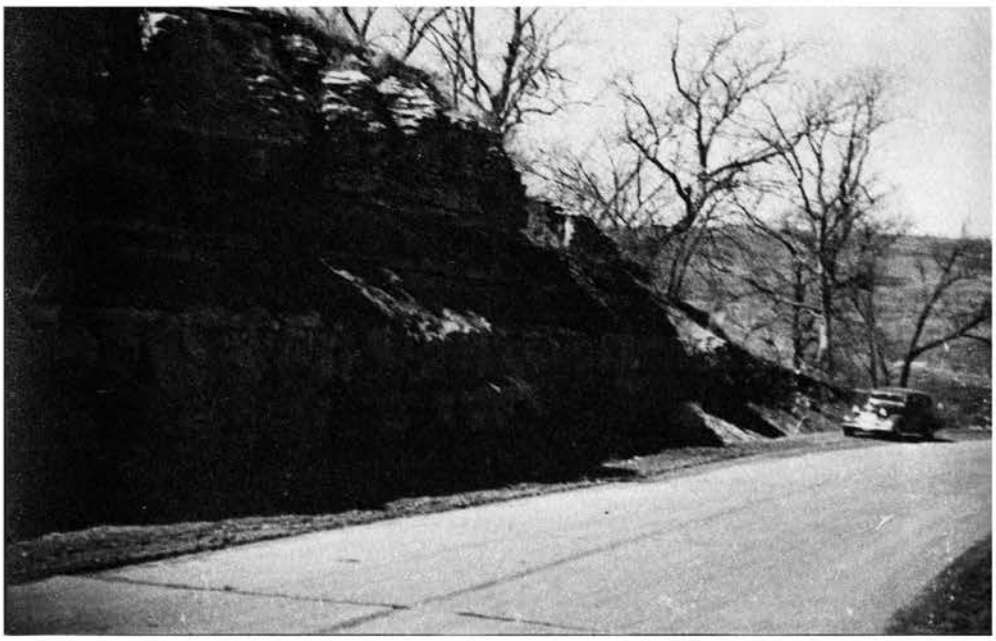
Quarry in Winterset Limestone
NE of Independence, Mo.

Plate XIV

Quarry Face
Winterset Limestone at top
Bethany Falls Limestone at bottom

Note:- Tunnel in Bethany Falls is
14 feet high.

Plate XV



Cut showing in descending order
Bethany Falls Limestone
Ladore Shale with persistent Middle Creek Limestone
Hertha Limestone

Pleasanton Formation:

The beds between the Hertha limestone member of the Kansas City formation and the Upper Worland limestone of the Henrietta make up the Pleasanton. The base of the Pleasanton also marks the dividing line between the Missouri and Des Moines groups as used in this report. This does not quite agree with Moore's classification (See Correlation Table), the essential difference being the presence of several beds above the Worland limestone in Kansas that are absent in Jackson County. Moore does, however, recognize the disconformity marked by the Warrensburg Channel sandstone, and places the contact between the Des Moines and the Missouri groups at this point. The Worland limestone has been arbitrarily chosen for the dividing line in this report for several reasons: (1) It lies at most a very few feet below the Warrensburg sandstone (when present in its marginal phase) (2) Some logs show it in direct contact with the sandstone. (3) It is most easily recognized in well logs because it marks the first definite lithologic change from the sands, sandy shales, and shales of the Pleasanton. (4) It is the most definite marker closest to the disconformity.

The presence of a Channel sandstone in Jackson County was discovered by Bartle[4] and referred by him to the Warrensburg

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4. Bartle, Glenn G., Geology of the Blue Springs Gas Field; Missouri Bur. Geology & Mines, 57th Biennial Rept., App. III, p. 16, 1933.

Channel deposits, at the time he was directing drilling operations in the Blue Springs gas field. "Its presence", quoting from the above paper, "was totally unexpected, and is of considerable stratigraphic importance from the fact that it tends to extend the importance of the unconformity within the Pleasanton".

In addition to the Warrensburg this formation contains two other persistent sandstone horizons. They are: (1) the Knobtown sand zone near the top of the Pleasanton and (2) the Wayside sand (of drillers), about 100 feet lower down in the formation. The Knobtown sand zone is composed of a persistent sand, marked by a calcareous cap lying about thirty feet below the Hertha limestone and of an irregular sand that may occupy, any portion or all, the interval between the persistent bed and the base of the Hertha. This irregular sand is a producing horizon in the Plattsburg area in northwest Missouri and more recently is the producing sand in a shallow gas field just west of Dallas, Missouri in Johnson County Kansas. The persistent bed is the Knobtown sand of the type locality previously described by Greene [5]. The lithology of these and other members of the formation is shown in the columnar section. The Pleasanton

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5. Greene, F. C., Oil and gas pools of western Missouri; Missouri Bur. Geology and Mines, 57th Bienn. Rept. Appendix II, p. 19, 1933.

has an average thickness of about 175 feet. Its base is exposed only in the extreme east part of the county and even here the exact relation to the overlying Warrensburg is not shown.

The outcrop of the Henrietta formation is limited to a very small area in Jackson County and because most of the information available concerning this formation is obtained from well logs it will be discussed briefly under subsurface formations. The following well log and detailed sections will give more specific information about these formations.

Log of Beaumont Apartment Hotel — Plate XVI A

Location:- 3028 Baltimore, Kansas City
SE¼ SW¼ NW¼ Sec. 17, T. 49, R. 33

Elevation:- 983

Map No. 55

STRATUM	THICKNESS FEET	DEPTH FEET	
Quaternary Series			
Surface clay	6	6	
Pennsylvanian System:			
Lansing Formation:			
Sand rock	9	15	
Gray lime	12	27	- Upper Farley
Blue shale	13	40	Lime
Gray lime	4	44	- Lower Farley
Blue shale	11	55	Lime
Kansas City Formation:			
Gray lime	45	100	- Iola
Blue shale	15	115	
Gray lime	10	125	- Raytown
Blue shale	3	128	
Gray lime	3	131	
Blue shale	10	141	
Red Rock	4	145	
Gray lime	2	147	- Cement City
Gray shale	11	158	
Black slate	1	159	
Green shale	2	161	
Blue shale	4	165	
Gray lime	6	171	- Drum
Blue shale	15	186	
Gray lime	2	188	- Black lime
Blue shale	8	196	
Gray lime	4	200)	
Blue shale	2	202)	
Gray lime	2	204)	- Winterset
Black flint	10	214)	
Blue shale	2	216)	
Gray lime	12	228)	
Black slate	2	230	

Beaumont Apartment Hotel continued

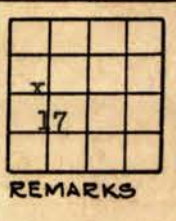
STRATUM	THICKNESS FEET	DEPTH FEET	
Kansas City Formation (Cont'd.)			
Gray lime	26	256	- Bethany Falls
Black slate	2	258	Lime
Green shale	3	261	
Gray lime	3	264	
Black slate	2	266	
Green shale	2	268	
Gray lime	7	275	- Hertha
Pleasanton Formation:			
Gray shale	10	285	
Gray sand	10	295	
Gray shale	13	308	
Gray sand	4	312	
Gray shale	8	320	
Blue shale	55	375	
Gray shale	5	380	
Sand lime	5	385	
Brown sand	29	414	- S.L.M. 416
Gray sand	11	425	
Blue shale	12	437	
Gray shale	11	448	
Henrietta Formation:			
Brown lime	7	455	- sand breaks
Blue shale	4	459	
Gray shale	3	462	
Black slate	4	466	
Gray lime	4	470	
Gray shale	1	471	
Oil sand	11	482	- Peru sand
Blue shale	8	490	
Gray lime	8	498	- Lexington Coal "Cap Rock"
Black slate	6	504	- S.L.M. 504
Brown sand	16	520	
Gray sand	7	527	
Gray shale	2	529	
Gray lime	7	536	
Cherokee Formation:			
Black slate	5	541	- gas 541 S.L.M. 541

Plate XVI B

GRAPHIC LOG

MISSOURI BUREAU OF GEOLOGY & MINES, ROLLA, MO.

MO SURVEY NO	OWNER Beaumont Apartments	
COUNTY Jackson	FARM 3028 Baltimore	WELL NO
T 49 / R 33	DRILLER S. W. Gatton	
	DATE Begun Dec. 15, 1933	
	ELEVATION 983 / PRODUCTION	
	SAMPLES STUDIED McCracken, Grohskopf, Hundhausen	



REMARKS

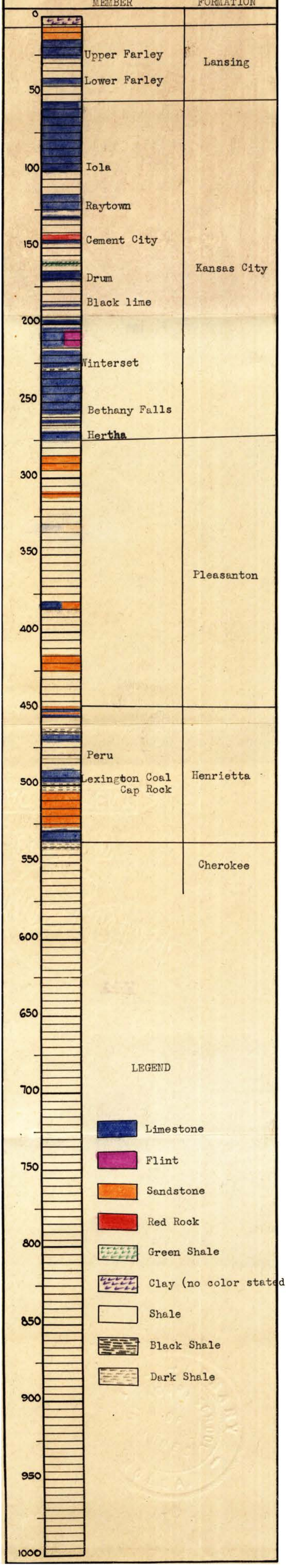
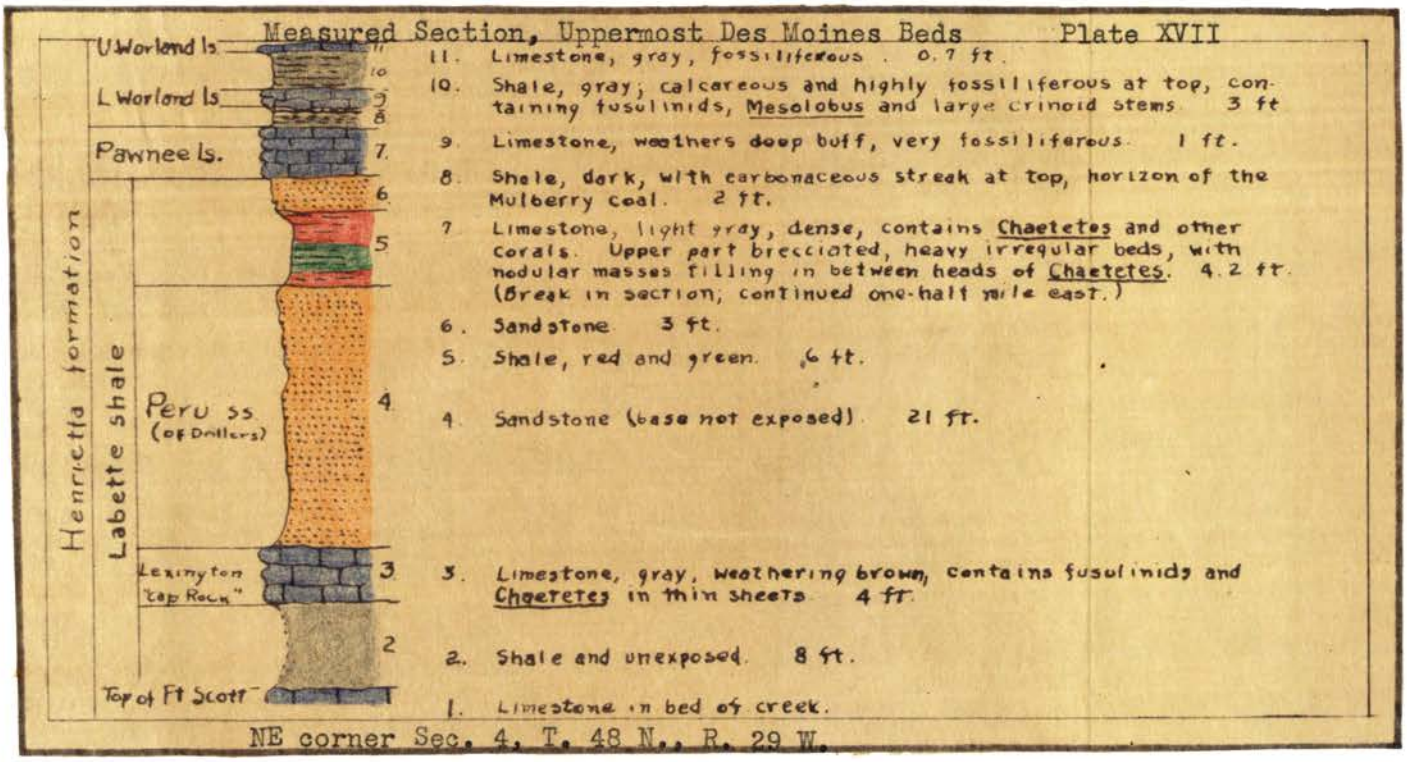


Plate XVII

Measured Section

Uppermost Des Moines Beds



NE corner Sec. 4, T. 48 N., R. 29 W.

Measured Section, Pleasanton and Lower Kansas City Beds

Plate XVIII

20. Limestone, light gray 14 ft. — Bethany Falls ls. — Kansas City formation

19. Shale, gray, middle 1 ft. black, slaty where unweathered. 5 ft.
18. Limestone, gray, nodular, increasingly so toward base, where it passes into c
17. Sandstone, nodular and calcareous at top 4.8 to 6 ft.
16. Shale, gray, sandy at top, argillaceous at base. 18.5 ft.

— Middle Cr. ls. — Ladore sh. — Kansas City formation

15. Limestone, bluish, weathering brown, with 0.2 gray shale partings 1.8 ft. below top. 3.3 ft — Hertha ls — Kansas City formation

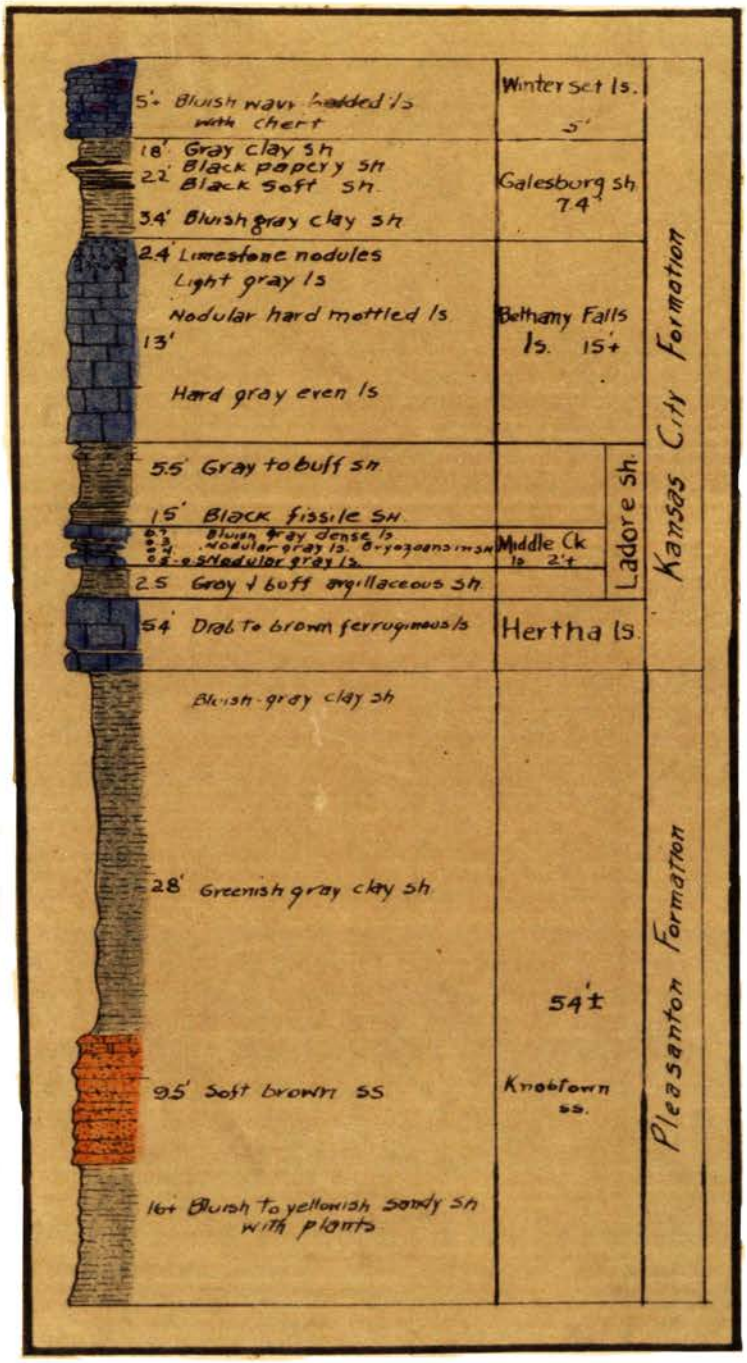
14. Shale, gray, with 0.2 ft. black shale 0.2 ft. above base. 1.5 ft.
13. Coal (Ovid) 0.2 ft.
12. Shale and clay, dark-gray clay at top, buff calcareous shale at base 5 ft.
11. Limestone, very nodular, gray. 1.7 ft.
10. Shale, maroon and green. 6.3 ft.
9. Sandstone, gray, calcareous at top, base not well exposed. 5 ft.
8. Shale, gray at top, concealed slope below. 73 ft. (In nearby areas this interval consists of shale, sandy shale and soft sandstone. About 4 ft. above base there is 0.5 to 0.8 ft. dark shaly fossiliferous limestone, underlain locally by thin coal. Below coal is clay with limy nodules, extending down to top of next sandstone).
7. Sandstone, gray, thin, even beds (Wayside of drillers, possibly upper Cleveland sand of Oklahoma). 6.5 ft.
6. Shale, bluish, locally tinted with maroon near base. 8 ft. (Outcrops in nearby areas have one-half to 3 inches of black shale, with Orbiculoidea, at this horizon. Possibly Dawson coal horizon.)
5. Limestone, gray, brecciated, slightly fossiliferous. Type of Sni Mills limestone (? base of Missouri.) 1 ft.
4. Sandstone, gray to greenish, weathering brown at top, upper surface has fusulinids of Des Moines (?) age (? top of Des Moines). 1 ft
3. Clay, gray at top, red below 4 ft.
2. Sandstone, soft at top, gray, thin-bedded, locally calcareous. 14 ft.
1. Shale, gray, sandy to bed of creek. This sandstone, possibly including the shale, is the marginal or "sheet" phase of the Warrensburg sandstone. The Worland limestone is only a few feet below. 8 ft.

— Pleasanton formation

At Sni Mills, NW¼ SW¼ Sec. 28, T. 48 N., R. 29 W.

Plate XIX

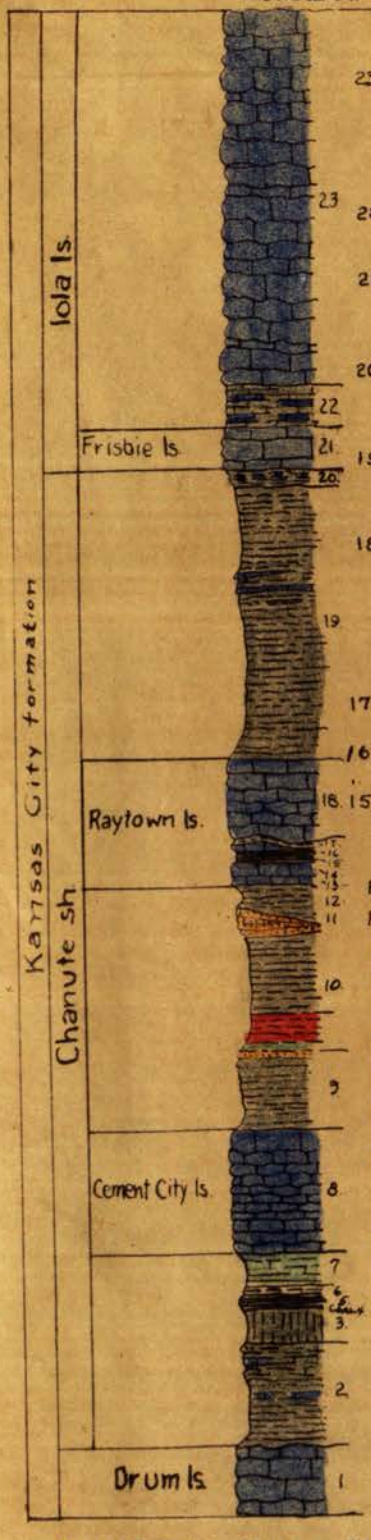
Measured Section
Upper Pleasanton to Winterset Limestone



Along U. S. Highway No. 50
Three-quarters of a mile west of Knobtown, Missouri
NE$\frac{1}{4}$ NW$\frac{1}{4}$ Sec. 22, T. 48 N., R. 32 W.

Measured Section, Drum to Iola Limestone

Plate XX



23. Limestone, light bluish gray weathers gray and buff, fine-grained, dense, thin to medium wavy beds with thin shale partings, contains abundant algal (?) veinlets and some clear calcite fillings. Richly fossiliferous, brachiopods and bryozoans most abundant. 28.5 ft.

22. Limestone, light bluish gray weathers gray, very soft, shaly, richly fossiliferous, fauna as in bed 23. 3.1 ft.

21. Limestone, bluish gray weathers gray and buff, massive below to thin-bedded and shaly above, fine-grained, dense. Contains abundant algal (?) veinlets, richly fossiliferous, 3.2 ft.

20. Shale, bluish weathers yellowish brown, calcareous, contains local lenses and nodules of limestone. Grades upward into bed 21. 1.2 ft

19. Shale. blue, weathers blue gray, clayey, unfossiliferous. Contains local thin lenses of hard fossiliferous sandy to crinoidal Limestone in upper middle part. 20.5 ft.

18. Limestone, light bluish gray, weathers gray to brown in upper part, light gray in lower part. Very fine-grained, dense, somewhat uneven bedding. Upper surface very sharp and even. Base sharp but wavy. Abundant algal (?) veinlets, richly fossiliferous, Large productids and Neospirifer 5.7 to 6.4 ft.

17. Shale, bluish gray, thinly laminated, calcareous, quite fossiliferous. Small brachiopods and bryozoans. 0.4 ft.

16. Limestone, bluish gray weathers gray. Coarsely granular, crinoidal, abundant fine fossil fragments (glauconite?) 0.5 to 0.7 ft.

15. Shale, black, fissile, except upper 0.1 and basal 0.1 ft which are dark gray thinly laminated, clayey. Uppermost band contains numerous phosphatic concretions (zone of Lenularia crystola) 0.8ft

14. Limestone, drab blue weathers light creamy to bluish gray, very dense, brittle, fine-grained, breaks in sharp angular fragments, a single massive bed, fine fossil fragments 0.6ft

13.

12. Shale, bluish gray, clayey, unfossiliferous. 1.8 to 3 ft.

11. Sandstone, greenish gray weathering brown. Shaly, calcareous carbonized plant fragments, 0 to 2.2 ft.

10. Shale, bluish gray, silty to clayey base mottled maroon and greenish gray clay bearing irregular limestone nodules. 9.4 to 10.4 ft.

9. Shale, greenish gray, sandy, containing numerous thin plates of hard calcareous gray sandstone or silty limestone 5.4 ft.

8. Limestone, light bluish gray weathers gray and light yellowish brown. Thin wavy bedding but outcrop is single massive ledge. Abundant fossils. 9.3 ft.

7. Shale, light greenish, clayey and calcareous. 2.4 ft.

6. Shale, black, hard, evenly laminated, slightly fissile. 0.8 ft.

5. Shale, light bluish gray, strongly calcareous. 0.8 ft.

4. Coal and carbonaceous shale. 0.1 ft.

3. Underclay. Dark bluish, hard, blocky. 2.6 ft.

2. Shale, bluish to greenish gray, contains numerous plates bluish-gray, fine, silty limestone. Basal 1 ft. highly fossiliferous 7.8 ft.

1. Limestone, light bluish gray, weathers light buff, very fine-grained, dense, numerous fossil fragments. Top 1 ft. subolitic Exposed 5 ft.

Main Street, Kansas City, Missouri SW¼ Sec. 8, T. 49 N., R. 33 W.

Plate XXI

Main Street Cut
See Plate XX for detail of beds

Subsurface Formations

The knowledge of formations which do not outcrop is necessarily limited to records of wells that have penetrated them, supplemented by information obtainable in areas where they do outcrop. The Pennsylvanian beds found beneath the lowest outcropping strata range from the Upper Fort Scott limestone of the Henrietta to the top of the Mississippi lime.

Henrietta Formation

The lithology and thickness of the members of the Henrietta are shown in sufficient detail in the Columnar section. It has a uniform thickness of about 100 feet throughout the county. The Lexington coal "Cap Rock" which lies in about the middle of the formation is one of the most persistent horizon markers in the region. It has been used in this report as the datum plane for the subsurface structure map, (See Plate II), and is the lowest dependable marker in the Pennsylvanian Series.

Cherokee Formation

The Cherokee has been left, for the most part, undifferentiated. Its approximate thickness and lithology are shown in the columnar section. The upper 60 to 100feet contains the Squirrel sand zone of the drillers. This has been, until recently, the most productive horizon in the county. The Ardmore limestone, consisting of one to three persistent beds lies about 50 to 100 feet below the top. It is a very unreliable marker

despite its persistence.

In townships 48 and 49 North, Range 32 West, there recently has been discovered a very productive sand body, which, due to its long, narrow outline, is called a shoestring sand. This sand is correlated with the horizon of the Burbank sand of Oklahoma and Kansas. From 20 to 50 feet lower in the section is another sand zone which has been called Bartlesville by the drillers. It is much higher stratigraphically than the true Bartlesville sand and use of this term should be discontinued. The remainder of the section to the top of the Mississippian is composed of sandy shales with sand lenses, dark shales or coals and occasionally a thin limestone. At or near the base a fairly persistent sandstone is encountered which has been called Burgess. It is probably the correlative of the Clear Creek sandstone of Vernon County and hence more nearly at the horizon of the true Bartlesville of Oklahoma.

The following logs give a more detailed picture of the stratigraphic sequence below the Pleasanton:

Plate XXII A

Log of Lone Jack Oil and Gas Company, D. L. Shawhan No. 6

Location:- NW corner SE SE Sec. 14, T. 47, R. 30

Elevation:- 1028

Map No. 23

STRATUM	THICKNESS FEET	DEPTH FEET
Quaternary Series:		
Soil and clay	11	11
Pennsylvanian System:		
Kansas City Formation:		
Lime	3	14
Blue shale	4	18
Dark shale	2	20
Lime (Winterset)	22	42
Shale	7½	49½
Lime (Bethany Falls)	17½	67
Dark shale	9	76
Light shale	19	95
Lime (Hertha)	3	98
Pleasanton Formation:		
Dark shale	11	109
Red rock	5	114
Shale	136	250
Lime	3	253
Shale	15	268
Brown lime and sand	4	272
Sand	6	278
Dark shale	6	284
Henrietta Formation:		
Lime (Pawnee)	2	286
Shale	14	300
Lime (Lexington "Cap Rock")	8	308
Slate (gas)	4	312
Lime	4	316
Shale	21	337
Lime	2	339
Black slate	2	341
Shale	14	355
Lime (Bottom of Fort Scott)	2	357

Lone Jack Oil and Gas Company, D. L. Shawhan No. 6 continued

STRATUM	THICKNESS FEET	DEPTH FEET
Cherokee Formation:		
Shale	13	370
Sand (gas) (Top of Squirrel)	3	373
Sandy shale	5	378
Gas sand	36	414
Shale	41	455
Lime (Ardmore)	2	457
Black shale	2	459
Light shale	25	484
Lime	1	485
Shale	30	515
Black shale	10	525
Gray shale	25	550
Lime	2	552
Gray shale	92	644
Sand	8	650
Gray shale	40	690
Water sand	10	700
Shale, dark	3	703
Mississippian System:		
Osage Group		
Keokuk-Burlington Formation:		
Limestone	167	870
Sedalia Formation:		
Limestone, cream coarsely crystalline chert, some chert, soft green pyritic shale	20	890
Kinderhook Group		
Chouteau Formation:		
Dolomite, buff to brown, succrose, much included white to gray to buff, vitreous, opaque and white chalky chert.	75	965
Compton Formation:		
Dolomite, buff to gray, finely crystalline with buff to gray-buff finely crystalline limestone, slightly fossiliferous	25	990
Kinderhook Formation:		
Shale and lime, some pyritic sandstone and medium to coarse angular glassy sand	10	1000

Lone Jack Oil and Gas Company, D. L. Shawhan No. 6 continued

STRATUM	THICKNESS FEET	DEPTH FEET	
Devonian System:			
Limestone, cream to buff, chalky, dense finely crystalline, included sand grains, white vitreous subtranslucent chert. Lime lithographic in part, some shale	90	1090	
Ordovician System:			
Dolomite buff to cream, finely succrose, much included sand, gray, vitreous and white chalky chert. Increasingly sandy toward bottom	15	1105	
St. Peter Formation:			
Sandstone, irregular, coarse to fine, heavily frosted, well rounded	30	1135	
Everton Formation:			
Sand at top as above, grading down into dolomite; dolomite, light cream to buff, dense to succrose, with much included sand, white vitreous opaque chert. Oolitic in part. Much shale in some portions	95	1230	
Canadian of E. O. Ulrich			
Jefferson City Formation:			
Dolomite, buff to cream, finely succrose, some white chalky chert. Chert increases toward bottom and is coarsely oolitic.	35	1265	T.D.

GRAPHIC LOG

MISSOURI BUREAU OF GEOLOGY & MINES, ROLLA, MO.

NO SURVEY NO. 2578

OWNER: Lone Jack Oil & Gas Co.

COUNTY: Jackson

FARM: H. Lee Shawhan

WELL NO: 6

T. 47N R. 30W

DRILLER: Above cemetery

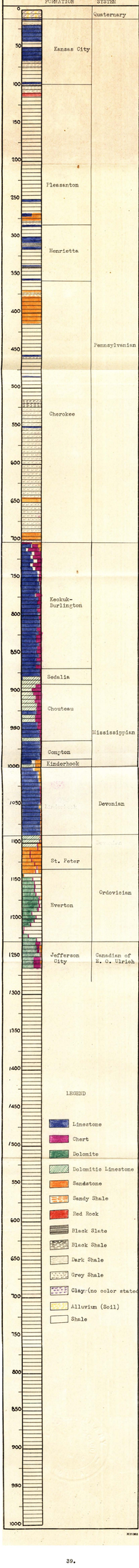
DATE: May-June 1932

ELEVATION: 1028

PRODUCTION:

SAMPLES STUDIED: Farrar

REMARKS:



X11382

Plate XXIII A

Log of Hulse, Christopher and Bradford, Mrs. M. Wilson No. 3

Location:- Sec. 17, T. 49, R. 32

Elevation:- 906

Map No. 115

STRATUM	THICKNESS FEET	DEPTH FEET	
Quaternary Series:			
Soil	3	3	
Clay	27	30	
Pennsylvanian System:			
Kansas City Formation:			
Lime	1	31	
Shale	3	34	
Lime	17	51)	
Shale	2	53)	Winterset
Lime	14	67)	
Shale, black	3	70	
Lime	20	90	- Bethany Falls
Gray shale	4	94	
Lime	1	95	
Shale	1	96	
Lime	12	108	- Hertha
Pleasanton Formation:			
Shale	1	109	
Lime	2	111	
Dark shale	5	116	
Light shale	9	125	
Dark shale - very muddy	24	149	
Lime	2	151	
Gray shale - very muddy	53	204	
Wayside sand - gas	11	215	
Gray shale	5	220	
Black shale	2	222	
Red bed	9	231	
Sand	12	243	
Gray shale	27	270	
Henrietta Formation:			
Lime	4	274	
Dark shale	2	276	

Hulse, Christopher and Bradford, Mrs. M. Wilson No. 3 continued

STRATUM	THICKNESS FEET	DEPTH FEET	
Henrietta Formation (cont'd.)			
Lime	3	279	
Gray shale	8	287	
Lime	5	292	
Sandy shale	3	295	
Sand, Peru - gas bubbles	7	302	
Black shale - gas bubbles	3	305	
Lime	6	311	- Lexington "Cap Rock"
Black shale - gas show, some water	9	320	
Light gray shale	18	338	
Lime	2	340	
Shale	3	343	
Lime	4	347	
Shale	10	357	
Lime	4	361	
Cherokee Formation:			
Shale	3	364	
Black slate - gas showing	8	372	
Sand- Squirrel, gas 100,000	83	455	
Shale	2	457	
Lime	3	460	- Ardmore
Dark shale	5	465	
Black slate - gas app. 50,000	6	471	
Lime	1	472	
Light sandy shale	11	483	
Lime	2	485	- set 490' of 4 7/8"
Dark shale, muddy	7	492	
Black shale	7	499	- gas showing
Lime	1	500	
Black slate	12	512	- gas 68,000 cu. ft.
Lime	1	513	
Gray shale	19	532	
Gas sand	8	540	
Water sand	37	577	- water
Lime ? (Siderite)	2	579	- Burbank Sand
Water sand	31	610	
Dark sandy shale	15	625	
Black slate	10	635	
White sand	10	645	- Hard - or limestone very much like water sand

Hulse, Christopher and Bradford, Mrs. M. Wilson No. 3 continued

STRATUM	THICKNESS FEET	DEPTH FEET	
Cherokee Formation (cont'd.)			
Dark gray shale	15	661	
Black slate	5	666	
Lite sandy shale	4	670	
Gray sandy shale	5	675	
Black slate	5	680	- Mundick
White shale sandy	15	695	
Gray sandy shale	37	732	
Mississippian System:			
Meramec Group			
Warsaw Formation:			
Chert, dense to quartzose, some sand	3	735	

9/14/35. 20 minutes open 7" Hg. in 2" = 465,600

Last 2' showed water

Plate XXIII B

GRAPHIC LOG

MISSOURI BUREAU OF GEOLOGY & MINES, ROLLA, MO.	
MO SURVEY NO 4189	OWNER Hulse, Christopher & Bradford
COUNTY Jackson	FARM Mrs. M. Wilson — WELL NO 3
T 49 — R 32	DRILLER R. Bradford
	DATE 9/13/35
X 17	ELEVATION 906 — PRODUCTION 465 M.
	SAMPLES STUDIED Mary Hundhausen

REMARKS Old well deepened from 540' to 735'

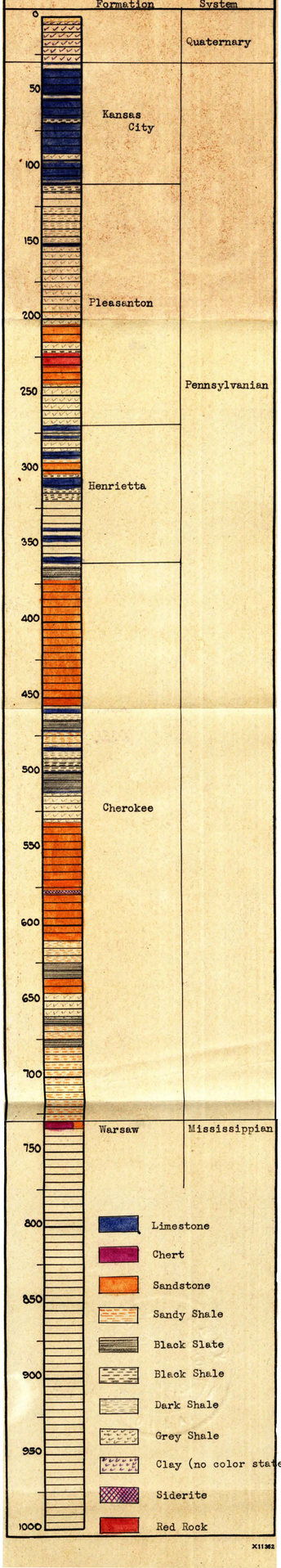


Plate XXIV A

Log of Russel et al., Bannister No. 1

Location:- Southwest corner NW¼, NE¼, NE¼, Sec. 36, T. 48 N., R. 33 W.

Elevation:- 1028.5

Map No. 51

STRATUM	THICKNESS FEET	DEPTH FEET
Quaternary Series:		
Soil yellow	16	16
Gravel - water	2	18
Pennsylvanian System:		
Kansas City Formation:		
Lime	4	22
Shale, blue	4	26
Lime, light	7	33
Shale, blue	12	45
Lime, light	10	55
Shale, dark	12	67
Shale, red	8	75
Lime, light	6	81
Shale, dark	4	85
Lime light	16	101
Shale, blue	25	126
Lime, light (Winterset)	44	170
Shale, dark	4	174
Lime, light (Bethany Falls)	16	190
Shale, black	4	194
Lime, light (Hertha)	14	208
Pleasanton Formation:		
Shale, black	3	211
Lime, light	11	222
Shale, light	89	311
Lime, light	4	315
Sand (Wayside) showing of oil	14	329
Shale, blue	56	385
Henrietta Formation:		
Lime, light	10	395
Shale, dark	10	405
Lime, light	5	410
Shale, light	5	415
Shale, dark	11	426

Russel et al., Bannister No. 1 continued

STRATUM	THICKNESS FEET	DEPTH FEET
Henrietta Formation (cont'd.)		
Lime, light (Lexington Cap Rock)	4	430
Shale, sandy	5	435
Sand, 80,000 cubic ft. gas	10	445
Shale, light	15	460
Shale, pink	4	464
Shale, dark	8	472
Shale, black, 100,000 cu. ft. gas	2	474
Shale, light	16	490
Henrietta-Cherokee contact (Approx.)		
Cherokee Formation:		
Shale, black	10	500
Shale, light	13	513
Sand (Squirrel, show of gas and oil)	33	546
Shale, dark	104	650
Shale, white, soft	15	665
Shale, blue	5	670
Shale, white	4	674
Lime	4	678
Sand-water-stands 500 feet from top	8	686
Shale, dark	22	708
Shale, light	17	725
Sand (black slate one foot)	7	732
Shale, gray	13	745
Shale, dark sandy	49	794
Lime, dark, hard	3	797
Shale, dark, sandy, hard	18	815
Mississippian System:		
Meramec Group		
St. Louis Formation:		
Limestone, gray, white, dense to crystalline	55	870
Spergen or Upper Warsaw Formation:		
Limestone, gray, white, cherty crystalline, shaly and glauconitic	65	935
Lower Warsaw Formation:		
Limestone, gray, white, cherty crystalline, dolomitic limestone in upper part	70	1005

Russel et al., Bannister No. 1 continued

STRATUM	THICKNESS FEET	DEPTH FEET	
Osage Group			
Keokuk-Burlington Formation:			
Limestone, gray white, cherty, dolomitic, crystalline	165	1170	
Sedalia Formation:			
Limestone, dolomitic, tan, white, to gray cherty	30	1200	
Kinderhook Group			
Chouteau Formation:			
Limestone, dolomitic, tan, white to grey, cherty dense	75	1275	
Hannibal-Sylamore Formation:			
Shale, green, calcareous, some sand	10	1285	
Devonian System:			
Limestone, gray white to brown, dense to lithographic, sandy at base	80	1365	
Ordovician System:			
Kimmswick Formation:			
Limestone, gray white, cherty sandy at top	35	1405	
St. Peter Formation:			
Sandstone, white	70	1475	
Canadian of E. O. Ulrich			
Jefferson City Formation:			
Dolomite, gray white to buff, cherty argillaceous, green shale at top	200	1675	
Roubidoux Formation:			
Dolomite, gray white, cherty, sandy, distinct sandstone at base	135	1810	
Ozarkian of E. O. Ulrich			
Gasconade Formation:			
Dolomite, gray white, cherty, base not reached	10	1820	T.D.

Casing Record

$8\frac{1}{4}$" - 21 feet, $6\frac{1}{4}$" - 447 feet (pulled) 4 7/8" 668 feet (pulled) 3" - 1550 feet (pulled)

Notes from Driller's Log.

At 977 feet increase of water, stands 320 feet from top; at 1417 feet gas show, set 3" casing with packer at 1400 feet, swabbed

STRATUM	THICKNESS FEET	DEPTH FEET
water down, next morning water stood at original level; at 1539-1541, more water, stands 275 feet from top; water at 1556 feet; more water at 1573-1583; crevice at 1655-57, more water; at 1731-1751, more water; two crevices at 1805-10, more water.		

GRAPHIC LOG

MISSOURI BUREAU OF GEOLOGY & MINES, ROLLA MO.

NO SURVEY NO	OWNER
2026	Russel et al

COUNTY	FARM	WELL NO
Jackson	Bannister	1

48 N 33 W — 36

DRILLER T. L. Russell

DATE Dec. 1923 - Dec. 4, 1924

ELEVATION 1029

PRODUCTION 150,000 cfg

SAMPLES STUDIED

REMARKS

Well plugged back to about 500 and saved as gas well in sand 435'-45 and shale 472-76.
SI$^{\#}$ - 21; 61$^{\#}$ - 647'; 4 7/8" - 650'.

FORMATION	SYSTEM
	Quaternary
Kansas City	Pennsylvanian
Pleasanton	
Henrietta	
Cherokee	
St. Louis	Mississippian
Spergen or Upper Warsaw	
Lower Warsaw	
Keokuk-Burlington	
Sedalia	
Chouteau	
Hannibal-Sylamore	Devonian
Kimmswick	Ordovician
St. Peter	
Jefferson City	
Roubidoux	Canadian of R. S. Ulrich
Gasconade	Ozarkian of R. S. Ulrich

LEGEND

- Limestone
- Chert
- Dolomite
- Dolomitic Limestone
- Green Shale
- Dark Shale
- Sandy Shale
- Shale
- Sandstone
- Red Rock
- Oolitic Limestone
- Gravel
- Black Shale

Pre-Pennsylvanian

The beds below the Pennsylvanian have produced neither gas or oil in Jackson County. In fact there is only one show of oil reported from the many wells that have penetrated the lower formations. These lower beds, while non-productive to date, are nevertheless of interest because of their productivity in other portions of the Mid-Continent region. They have been the subject of intensive study by the Missouri Geological Survey over the past 15 years and are well defined. The following log shows in detail the formations that may be expected, from the base of the Pennsylvanian to the Pre-Cambrian basement rocks in Jackson County. The correlations are by Mr. H. S. McQueen and members of the Survey staff.

Plate XXV A

Log of Martin and Reiser, Anne Perrin No. 1

Location:- NE¼ SW¼ SE¼ SE¼ Sec. 17, T. 50 N., R. 30 W.

Elevation:- 772

Map No. 5

STRATUM	THICKNESS FEET	DEPTH FEET	
Quaternary Series:			
Top Soils	0	55	
Sand and small gravel	29	84	
Pennsylvanian System:			
Henrietta formation:			
White lime	9	93	
Dark blue shale	22	115	
Light shale	3	118	
Oil sand	3	121	
Light shale	9	130	
Lime	7	137	
Shale	1½	138½	
Lime	5½	144	- Lexington "Cap Rock"
Black shale	2	146	
Light shale	9	155	
Gray shale	10	165	
Lime (bubbling)	4	169	
Dark shale	11	180	
Lime	8	188	
Cherokee formation:			
Blue and dark shale	307	495	
Mississippian System:			
Meramec Group			
St. Louis formation:			
Limestone, light gray, finely crystalline, with chert, some dark to black shale, pyrite	15	510	
Spergen or Upper Warsaw formation:			
Limestone, gray to light brown, crystalline light to black chert, greenish shale, pyrite slightly fossiliferous	50	560	

Martin and Reiser, Anne Perrin No. 1 continued

STRATUM	THICKNESS FEET	DEPTH FEET
Osage Group		
Keokuk-Burlington formation:		
Limestone, light to dark gray, light brown, medium to fine-grained, crystalline, considerable chert, white, blue mottled to black, dense	180	740
Sedalia formation:		
Limestone, gray to dark gray, brown, fine-grained crystalline dense white chert at 748.	10	750
Kinderhook Group		
Chouteau formation:		
Limestone, light to dark gray, fine-grained to coarse, crystalline	80	830
Kinderhook Shale		
Shale, green, fine particles some pyrite, few sand grains	5	835
Devonian System:		
Lime, dense, finely crystalline lithographic, cream to buff white, brown, buff granular dolomite, white, vitreous chert	120	955
Ordovician System:		
Kimmswick formation:		
Chert, white, blue, gray, live; limestone, light to dark, gray, some finely crystalline, sand grains, well rounded	40	995
St. Peter formation:		
Sandstone, white to buff, frosted well rounded grains	106	1101
Canadian System of E. O. Ulrich		
Jefferson City formation:		
Dolomite, light, gray to white, buff, finely crystalline, cherty some sand, little shale	214	1315
Roubidoux formation:		
Dolomite, light gray, white to buff, finely crystalline, much white, clear and frosted sand, well rounded grains some white to gray chert	130	1445

Martin and Reiser, Anne Perrin No. 1 continued

STRATUM	THICKNESS FEET	DEPTH FEET
Ozarkian of E. O. Ulrich		
Gasconade formation:		
Upper Gasconade		
Dolomite, light gray finely crystalline, considerable angular sand grains	15	1460
Lower Gasconade		
Dolomite, light, bluish to dark gray, brown to buff finely to coarsely crystalline; chert, dense blue, dead white, gray to dark, some sand pyrite	170	1630
Gunter formation:		
Dolomite, light gray to white, crystalline, considerable amount of sub-angular and frosted sand	35	1665
Eminence formation:		
Dolomite, light gray, brown, buff, bluish to dark gray, finely crystalline, little chert and occasionally some sand, green shale pyrite	380	2045
Potosi formation:		
Dolomite, light to dark gray finely crystalline, granular, some sand pyrite	35	2080
Transition Zone		
Dolomite, light gray, finely crystalline, granular grading to 50 percent sand	25	2105
Cambrian System:		
Lamotte formation:		
Sandstone, slightly dolomitic near top, brown, bluish gray to white, clear, frosted, fine generally well rounded sand grains below	120	2225
Pre-Cambrian		
Granite Wash		
Sandstone, coarse angular fragments of pyrite, feldspar grading into coarse quartz feldspar gravel	50	2275

Martin and Reiser, Anne Perrin No. 1 continued

STRATUM	THICKNESS FEET	DEPTH FEET
Granite Angular fragments of quartz pink feldspar, hornblende, biatite, etc. grading down into granite composed salmon pink feldspar with minor amounts of quartz	1925	4200

Note:- Pre-Pennsylvanian section from sample determination of insoluble residues by M. Hundhausen, E. McCracken, and J. Grohskopf.

PLATE VII

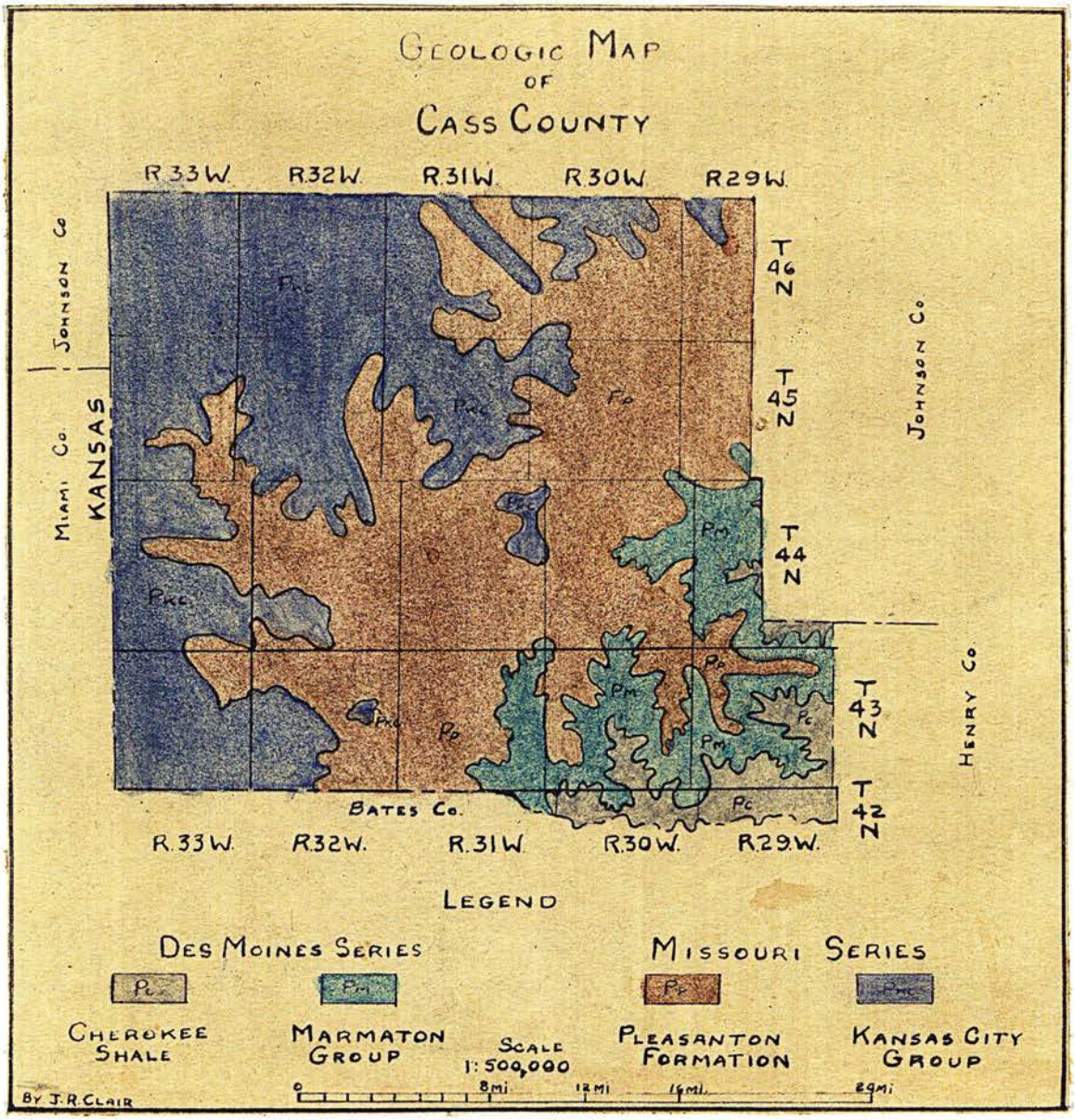

GEOLOGIC MAP
OF
CASS COUNTY
R.33W.
R.32W.
R.31W.
R.30W.
R29W.
T 46 N
T 45 N
T 44 N
T 43 N
T 42 N
JOHNSON Co
MIAMI Co.
KANSAS
JOHNSON Co.
HENRY Co.
BATES Co.
Pkc
Po
Pm
Pc
LEGEND
DES MOINES SERIES
MISSOURI SERIES
CHEROKEE SHALE
MARMATON GROUP
PLEASANTON FORMATION
KANSAS CITY GROUP
SCALE 1:500,000
0
8mi
12mi
16mi.
24mi
BY J.R.CLAIR

Plate XXV B

GRAPHIC LOG

MISSOURI BUREAU OF GEOLOGY & MINES, ROLLA, MO.

NO. SURVEY NO.	OWNER
5061	Martin and Selzer
COUNTY	FARM
Jackson	Anne Ferrin
WELL NO.	1
T. 48 R. 32 S. 17	DRILLER
DATE	
ELEVATION	PRODUCTION
771	Show of oil
SAMPLES SUBMITTED	
Cuttings, Strawberry, Sandhausen	
REMARKS	

FORMATION	SYSTEM
Quaternary	
Reworked	
Pennsylvanian	
Cherokee	
St. Louis	Mississippian
Sporgen of Upper Warsaw	
Keokuk-Burlington	
Sedalia	
Chouteau	
Transported Chats	
Devonian	
Kinderhook	
St. Peter	Ordovician
Jefferson City	Canadian of H. C. Ulrich
Roubidoux	
Upper Gasconade	Canadian of H. C. Ulrich
Lower Gasconade	
Gunter	
Eminence	
Potosi	
Transition zone	
Lamotte	Cambrian
Granite Wash	Pre-Cambrian
Granite to total depth, 4200 Feet.	

LEGEND

- Limestone
- Chert
- Dolomite
- Dolomitic Limestone
- Shale
- Green Shale
- Black Shale
- Sandstone
- Granite Wash
- Granite
- Shaly Limestone

STRUCTURAL GEOLOGY

Review of Earlier Work

The similarity of conditions in eastern Kansas, where oil and gas have long been produced, to structural conditions within the area of outcrops of the Pennsylvanian system in Missouri, has for many years been of considerable interest to geologists.

Hinds and Greene[6] published a structure map of the entire region of Pennsylvanian outcrops in Missouri. This map shows a number of gentle folds trending northwest and southeast. One of the larger of these folds, called the Kansas City-Centerview anticline, passes in a northwest-southeast direction across Jackson County. The adjoining syncline is unnamed but it coincides in general with the Kansas City-Blue Springs-Lone Jack syncline of this report. The map is on a small scale with a 50 foot contour interval, hence close coincidence with more detailed structural work is not to be expected. It is of value as a guide to general structural conditions, however, and its true value is being realized more and more, as the nature of the deformations accompanying the major folds becomes more evident.

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6. Hinds, Henry and Greene, F. C., The stratigraphy of the Pennsylvanian series in Missouri: Missouri Bur. Geology and Mines, 2nd ser., Vol. XIII, p. 202, plate XXIII, 1915

McCourt[7] reviewed the general structure of the county, calling attention to the direction of dips and the fact that the normal dip is very flat varying from 6 to 10 feet per mile. He includes a structural map (1) of Kansas City with the Raytown limestone as the datum plane. This map is of considerable interest and will be referred to later in this report. His discussion of the structural significance of the map is brief and no mention is made of structural conditions in the remainder of the county.

Wilson[8] discussed the general geologic conditions of Jackson County and published a structural contour map which included the southwest township of the county. He also reviewed the work of Hinds & Greene and reproduced the general structure map of their report[9].

Greene[10] published structure contour maps of the Knorpp, Shawhan, Lone Jack and Independence pools together with brief discussions of the producing horizons of these areas and also discussed the Belton-Martin City district but did not include a

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7. McCourt, W. E., The geology of Jackson County: Missouri Bur. Geology and Mines, 2nd series., Vol. XIV, p. 74-75, 1917

8. Wilson, Malcom E., The occurrence of oil and gas in Missouri: Missouri Bur. Geology and Mines, 2d Ser., Vol. XVI, p. 142-152, 1922.

9. Wilson, op cit, p. 231, plate IV

10. Greene, F. C., Oil and gas pools of western Missouri: Missouri Bur. Geology and Mines, 57th Bienn. Rept., p. 31-41, 1933.

map. In a later paper[11] he published structure contour maps of the West Grandview and Marotta pools with brief discussions.

Bartle[12] published a detailed geological report covering an area in Township 48 North, Ranges 31 and 32 West known as the Blue Springs and Bannister Ridge fields. He reviewed previous works and gives a detailed account of the structure of the area, together with maps and cross-sections.

Names of Structures:

It will be seen from the structure contour maps that there are several major structural features within the area. These with their accompanying minor structures comprise the structural detail of the county.

The following names, indicated on the structure maps by their key numbers, have been selected from towns and other geographic features within the area and will be used in the discussion of the structural geology of the county. They are: the Martin City anticline, the East Grandview anticline, the Lees Summit nose, the Knorpp anticline, the Shawhan and Lone Jack domes, the Adams Cemetery anticline, the Indian Creek dome,

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11. Greene, F. C., Oil and gas developments in Missouri in 1933-34: Missouri Geological Survey and Water Resources, 58th Bienn. Rept. App III, p. 13-17, 1935.
12. Bartle, Glenn G., The geology of the Blue Springs gas field: Missouri Bur. Geology and Mines, 57th Bienn. Rept., App. III, p. 27-34, p. I, II, III, 1933.

the Bannister Ridge anticline, the Blue Springs anticline, the Raytown anticline, the Centropolis dome, the Independence nose, the Rock Creek nose, the Penn Valley syncline and the Kansas City-Blue Springs-Lone Jack syncline. In addition to those named there are other features, indicated by the contours, but too generalized to warrant naming.

Structural Detail

The large anticlinal fold which trends in a southeast to northwest direction across the entire county is the most prominent structural feature of the region. This anticline is bounded on both sides by well developed synclines that are evidently the controlling features in the structural development of the county. These major features coincide closely with the general pattern of the original structure map published by Hinds and Greene[13]. The axis of the Kansas City-Centerview anticline of this old report has a more westerly trend than the major anticline of the present report, but in general the trends are the same. Of the two synclines, the Kansas City-Blue Springs-Lone Jack syncline (XVI on Maps I and II) is the larger. It is more clearly defined than the Penn Valley syncline (XIII), hence is more prominent. It extends from the Missouri River at the northwest corner of Kansas City to the southeast corner of the county, having a rather curving axis with the convex side to the northeast. As defined on the structure maps it is extremely narrow in some parts of its extent and rather wide in others.

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13. Hinds, Henry and Greene, F. C., The stratigraphy of the Pennsylvanian series in Missouri: Missouri Bur. Geology and Mines, 2d Ser. Vol. XIII, p. 202, pl. XXIII, 1915.

The Penn Valley syncline (XIII) bounds the major anticline on the west and southwest, extending from the northwest corner of Kansas City in a direction slightly east of south to the southern border of the county. It divides north of the town of Grandview, one fold going to the west of the town and the other to the east, the divergence being due to the East Grandview anticline (II). The greater part of Kansas City proper lies within this syncline and the structure coincides closely with the surface structure as shown in McCourt's [14] structure map of Kansas City based on elevations of the Raytown limestone. South of Kansas City it separates the major anticline from the Martin City anticline, the Indian Creek dome and the South Kansas City dome. These structures make up the northern extension of a smaller anticline that reaches its fullest development south of the county line. In sections 17 and 20, Township 49 North, Range 33 West is a structural sink which lies in the trough of the Penn Valley syncline and it is this structural condition that is responsible for the preservation of remnants of the Lansing formation that are found in this area.

The Martin City anticline (I, A,B,C,D,E,F,G,H,I) is

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14. McCourt, op cit. plate 4.

Insert -Page 60

The two diverging limbs of the syncline continue to the south forming the two major synclines of the Cass County structure maps.

the most prominent feature of the smaller anticlinal fold mentioned above. The axis of the structure though slightly curving, parallels roughly that of the major anticlinal fold to the east. It is composed of a series of small domes separated by rather sharp synclines, all lying along a major axis, which are indicated on the structure maps by the letters as listed above. These domes comprise the only commercial oil field in Jackson County and are unique for that reason. While some gas has been produced in the area it is very small and wholly secondary to the production of oil. The Klapmeyer Dome (D) is one of the two places in the county where both gas and oil in commercial quantities occur in the same structure. The wells high up on this structure produced gas and those on the southwest flank yielded oil. The West Grandview terrace is really a portion of the Klapmeyer dome. It is given a separate name because of a previous published report on the area. This terrace has produced no oil and the amount of gas recovered was rather disappointing. The greater part of the production is from the Peru sand of the Henrietta formation. A secondary high on the Carlson dome (N) has a dry hole on the very top of the structure. This is one of several instances in various parts of the county where dry holes are located high structurally. The common explanation is that the sand on top is too compact and therefore cannot hold gas. How this can be consistently true is a little hard to understand.

Locally a tight sand might be due to any of several special conditions, such as unusual cementation by underground water or secondary deposition of iron carbonate in quantity but these might occur at any other place on the structure. In this particular instance however, the sand horizon is shaly and the problem is one of lack of sand rather than porosity. A possible explanation[15] is that diastrophic movement had already started at the time of deposition of the Cherokee and that the uplifted portions were subjected to erosion while adjacent areas were subject to deposition of clastic material. This explanation, however, is hardly applicable in Jackson County where sand is found apparently without relation to structural conditions and the structure is mostly post-Pennsylvanian in age. The syncline on the west of the Martin City anticline, though rather shallow is well defined. The syncline to the east is a part of the Penn Valley syncline and is sharper and much deeper.

To the north of the Martin City anticline and separated from it by a flat saddle is the Indian Creek dome. The dome is irregular and its two axises are almost equally developed, the major axis striking northwest-southeast. Here again dry holes

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15. Cadman, W.K., The golden lanes of Greenwood County, Kansas: Am. Assoc. Petroleum Geologists Bull., Vol. 11, No. 2, p. 1179, 1927.

are found high up on the structure. It is of little importance commercially. The South Kansas City dome farther to the north is rather small with low closure. The axial trend is again northwest-southeast. All the wells have been used for private consumption.

The East Grandview (II) anticline lies between the arms of the Penn Valley syncline. It is irregularly elongated in a slightly northeast-southwest direction and has forty feet of closure. Production, contrary to the general rules is found well down on the west side while the southeast side is entirely barren. A particularly interesting feature is the close coincidence between the surface structure as depicted by the Bethany Falls map (Plate I) and the subsurface structure as shown on the Lexington map (Plate II).

The major anticlinal fold, comprising the area between the previously described, well-defined synclines, is composed of a large number of structural features. They will be discussed under the names by which they are designated on the structure contour maps.

The Lees Summit nose is a prominent structural feature of this major anticlinal fold and it bears a close relationship to the other structures which make up the southern portion of the fold. The Lees Summit townsite dome (A) consists really of two flat-topped domes, divided by a sharp syncline with a

closed depression in its trough. They have only 30 feet of closure but this does not show on the Lexington map because few wells have gone below the Warrensburg Channel sand and not enough information is available to outline any structure on this horizon.

A striking feature of the Lees Summit nose is a rather prominent structural sink (B). The sink is small as seen on the Bethany Falls map but is much accentuated on the lower horizon. Of particular interest is the presence of several small gas wells on the west edge of the sink, whereas wells on the east flank, much higher structurally, are totally dry. A well (Map #2) S. E. Edmondson, NW$\frac{1}{4}$, Sec. 1, T. 47 N., R. 32 W., in the bottom of the sink yields comparatively fresh water in the Warrensburg sand and is used as a water well.

The nose widens to the southeast from Lees Summit and on this widening flank are found the Adams Cemetery anticline, and the Knorpp, Shawhan and Lone Jack domes. The Adams Cemetery anticline is irregularly elongated in a northeast-southwest direction, with a total closure of about 40 feet. The wells are all rather small. The Knorpp dome (V) is situated on the Cass-Jackson county line. It is irregularly elongated in a northwest-southeast direction with a total closure of about 30 feet. The dome is bordered on the north by a shallow syncline and on the south by a sharp depression which does not show on the structure

Insert - page 65

south and the Cockerell sink( )

To the / Southwest of the Shawhan dome is a large structural sink/which has been broken by the Powell Sch. ( )

~~Cockerell~~ fault. Wells drilled in it produce large quantities of water from the same horizon that produces gas on the domes. The Hartz dome( ) is small with only about ten feet of closure but the dip on the northeast and north flanks is extremely sharp.

contour map because that part of it lies in Cass County. The Shawhan and Lone Jack domes are elongated in a north-south direction with a suggestion of a northwest-southeast trend. They have a total closure of 40 and 50 feet respectively. Southwest of the Shawhan dome is a small structural sink, that appears only on the Lexington map. Wells drilled in it produce large quantities of water from the same horizon that produces gas on the domes.

The Bannister Ridge anticline (XI, A,B,C,D,E,F,G,H, I,J,K,L,M, and N) covers practically the entire area of Township 48 North, Range 32 West. The names applied to the different structural features which make up the anticline were first used by Bartle [16] and are used in this report together with additional ones which were found necessary because of the greater detail of the present maps. The anticline is bounded on the west by the Penn Valley syncline (XIII) on the south by the Ervin syncline (N) on the north by the Jennings (I) and Richards Field (L) basins and on the east by the Unity syncline (XII,H). The many small domes that comprise the fold are flat-topped with low closures. A structural sink (M) lies in almost the exact

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16. Bartle, Glenn G., The geology of the Blue Springs gas field: Missouri Bur. Geology and Mines, 57th Bienn. Rept., App. III, P. 28, 1933.

Insert end of 1st paragraph---page 65

The Cockerell sink ( ) forms the controlling syncline for the Adams Cemetery anticline, the Shawhan dome, the Knorpp dome and the Hartz dome. It is of considerable size and is broken near the middle by the curving axis of the Powell School Fault. The western side of the fault is downdropped and has about 110feet displacement. Wells drilled in the downtrown portion of the sink have found beds as high stratigraphically as the Raytown limestone in a r region in which the Winterset and Bethany Falls limestones are the outcropping rocks. The actual tracing of the fault is difficult and it s found definitely in only four places along some six miles of apparent strike. The fault dies out to the north in the Adams Cemetery an ticline and disappears to the south at the Cass-Jackson County line. The structure of the sink as interpreted on the structure map is based on estimated elevations from available interval data. Since most of the fault trace is obscure, its location, except where marked in solid line is largely hypothetical and subject ot change as additional information is obtained.

center of the area. It is of considerable importance in that it is the controlling syncline for all of the small domes. The Jennings Basin (I) mentioned above is another structural sink of considerable size. A lone wildcat well (Map No. 2) George Jennings NE¼ NW¼ NW¼ Section 3, Township 48 North, Range 32 West, in this basin has an elevation of 828 feet on the top of the Bethany Falls limestone. Between this well and one 3¼ miles to the south the total structural relief is 103 feet. Since the normal dip is about six feet per mile the total structural irregularity is a little more than 80 feet. On the flanks of the Jones anticline (H) which has a few small gas wells, lies a small oil field owned and operated by the Unity School of Christianity. The oil is produced from the Squirrel sand and is of very low gravity. The Yost anticline (K) is flat-topped and appears unusually favorable for production of gas, but the logs of two wells drilled on it show no sand of any consequence.

The Blue Springs anticline (XII, A,B,C,D,E,F,G,H,I) lies to the east of the Bannister Ridge area and is separated from it by the Unity syncline (H). The Burris syncline (I) bounds the anticline on the north, east and south and is considerably greater in extent than indicated in the previous report on the area, Bartles[17] map showing a saddle between the Burris

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17. Bartle, Glenn G., The geology of the Blue Springs gas field: Missouri Bur. Geology and Mines, 57th Bienn. Rept., App. III, p. 8, pl. I, 1933.

syncline and the Selvey depression. On the maps of this report the Burris syncline joins the well defined Kansas City-Blue Springs-Lone Jack syncline on the north and merges with the aforementioned Selvey depression on the south extending entirely around the east and south edge of the anticline. In the deepest part of the syncline the top of the Bethany Falls limestone sinks to a level of 848 feet, considerably lower than elevations of 910 feet on the Hughes terrace (S), $1\frac{1}{4}$ miles to the southeast and 940 feet on the Thornton dome (D), $2\frac{1}{2}$ miles straight south. The Morris nose (J) according to Bartle [18] evidently does not rise high enough out of the dominant syncline to produce gas.

Wells drilled on the Howard dome (A) provided evidence of the true nature of the Channel sandstone deposits in Jackson County which later was responsible for correlating them with those of the Warrensburg Channel sandstone. "T. C. Howard No. 2 (Map No. 10) SW, Section 8, Township 48 North, Range 31 West," quoting from Bartle[19] "with a production of 500,000 cubic feet in the channel deposit, was deepened to reach the Squirrel horizon in the Cherokee. One hundred and sixty-five feet of solid sandstone

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18. Bartle, idem, p. 29.
19. Bartle, op cit. p. 33.

was drilled, covering the interval usually represented by the lower Pleasanton, Henrietta and upper part of the Cherokee formations". The channel character is excellently shown because wells one-quarter mile to the north and east respectively showed no sandstone at that horizon. Bartle's[20] map of the area shows a closed depression in the north central portion which the present maps fail to show, the Velie depression of the earlier report becoming a minor syncline on the Bethany Falls map (Plate I) of the present report, and merging into the Unity syncline (H) on the Lexington map (Plate II).

The Blackwell anticline (E) is a cross fold with its axis trending northeast-southwest. The structure has several wells producing from the channel sandstone but there is no production from lower formations. A dry hole (Map No. 163) to the southwest of the Blackwell anticline encountered a rather thick Pleasanton section and the shallow syncline between the Ritter nose and the Blackwell anticline is accentuated on the subsurface formations and becomes a major synclinal feature, separating the Blue Springs anticline from the Lees Summit nose.

The Ritter nose, as intimated by Bartle[21], is the

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20. Bartle, idem. p. 8, pl. I.
21. Bartle, idem. p. 32.

extension of the larger anticline which underlies Lees Summit. The structure, as seen on the Bethany Falls map, is an irregularly elongated anticline with a north-south axis separated from the main Lees Summit dome by a sharp syncline. The production is from the Warrensburg channel sand and here, as on the Blackwell anticline, the lower formations have been penetrated by only a few wells. Lack of wells which cut the horizon of the Lexington "Cap Rock" in this area has made necessary the use of the interval, between the top of the Bethany Falls limestone and base of the Lexington "Cap Rock", to obtain sufficient control for contouring the Lexington map (Plate II).

The Hughes terrace (G), according to Bartle[22] "is an outstanding example of the value of a flattening formation on the reversal of dip". The largest well in the field, Hughes No. 4 (Map No. 25) is located here and had an initial open flow of 2,200,000 cubic feet at a depth of only 220 feet. The terrace merges with the Graves dome to the south on the subsurface map. The Cordson nose (B) is really a continuation of the Hughes terrace. Wells that have been drilled rather far out on the nose penetrated very little sand and produced no gas. The Graves dome (C) is one of the highest structures of the area.

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22. Bartle, op cit. p. 30.

On this dome an isolated well, Graves No. 1 (Map No. 92) NE¼ Section 23, Township 48 North, Range 31 West, producing from the so-called Bartlesville sand was reported by Bartle[23]. He says, "This well evidently struck a small lens for wells a quarter of a mile west and south did not obtain any gas or any considerable amount of sand". However, a well, Graves 1-B (Map No. 52) SE¼ SE¼, Section 14, Township 48 North, Range 31 West, drilled subsequent to the publication of the above report at a distance of 1200 feet northwest of Graves No. 1 (Map No. 92) penetrated 140 feet of sand at this horizon but failed to produce any gas.

The Thornton dome (D) is an elongated structure paralleling the Graves dome and separated from it by a flat saddle. This dome furnishes another illustration of the occurrence of dry holes upon the top of structures. The two wells, T. T. Boten No. 1 (Map No. 84) and No. 2 (Map No. 85) SE¼, Section 15, Township 48 North, Range 31 West, though located on top of the dome are both dry holes. In the case of the Blue Springs anticline and in the Bannister Ridge anticline as well, it is worthy of mention that there are no producing wells which are not closely connected with "structural highs".

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23. Bartle, idem., p. 12.

Bartle[24] states, "that drilling in synclines or on the normal dip has been uniformly unsuccessful."

The Raytown anticline(XV,A,B,C,D) is an irregular shaped structure with three small domes. Two of the domes, the Municipal Farm (C) and the West Raytown (B) have a general north-south trend. Both are small and have no commercial wells. The Raytown dome (A) is a cross-fold on the Raytown anticline with a northeast-southwest axis. It is long and narrow with a flat top and low closure. The producing wells are comparatively small and have been used only for private consumption. The Leeds syncline (D) bounds the Raytown anticline on the north. It is a well developed feature and appears to be an arm of the Penn Valley syncline.

The Blue Ridge anticline (XIV,A,B,C,D) is the most recently discovered structure in the county. It is composed of three irregular domes, the Marotta (A), Logan (B) and Davis (D) and a long narrow nose, the Sni-A-Bar Garden nose (C). It is distinctive in that it is the only place, so far as the writer can determine where surface and subsurface structure coincide with a shoestring sand. On the other hand there is complete lack of coincidence with structure shown by this same

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24. Bartle, op. cit. p. 31.

shoestring sand in other parts of the area. The Marotta dome (A) appears to be a cross-fold with a northeast-southwest axis. It has a total closure of about 20 feet. A structure map of this area has been previously published[25] but due to additional information now available the present map (Map II) does not agree with it in detail. The Logan dome (B) has a north-south axis with a closure of 30 feet. The Davis dome (D) has only 10 feet of closure. The axis of the Blue Ridge anticline is slightly curved with the convex side to the northeast. The anticline is bounded on the north and east by the Kansas City-Blue Springs-Lone Jack syncline and on the south and west by the Leeds and Penn Valley synclines.

The Centropolis dome is a small subsurface structure elongated in a north-south direction that lies entirely in the valley of the Big Blue River. It is comparatively flat-topped with very low closure.

The Rock Creek nose (XVIII) is separated by a flat saddle from the Centropolis dome. The western portion (Kline Paul, A) was described by Greene[26] in conjunction with structure

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25. Greene, F. C., Oil and gas developments in Missouri 1933-34: Missouri Geological Survey and Water Resources, 58th Bienn. Rept., App. III, p. 13, 1935.
26. Greene, idem. p. 13.

contour map of the Marotta dome and appears on that map to be closely related to it. The maps accompanying the present report, however, show that it is really a part of another structure separated from the Blue Ridge anticline by the Kansas City-Blue Springs-Lone Jack syncline (XVI). The Rock Creek nose is really the westward extension of a larger westward plunging nose that extends three-fourths of the way across the county. The Independence nose (XIX) is apparently a minor projection of the above mentioned large structural nose. It has a north-south axis which merges into the east-west axis of the larger feature, on the south. A structure map based on altimeter elevations was previously published by Greene[27] but it does not agree with the present maps except in a very general way.

In addition to those features which have been named and discussed in the preceding pages, there are others too generalized to warrant naming, but of sufficient importance to deserve further mention. Since they are in areas where structural control is lacking the discussion of these has to do with recommendations for their future development, hence they will be touched upon later in the report.

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27. Greene, F. C., Oil and gas pools of western Missouri: Bur. Geology and Mines, 57th Bienn. Rept., App. II, p. 49, 1933.

Summary of Structural Features

In considering the county as a whole there are several outstanding features.

(1) Anticlines are numerous but the synclines appear to be the dominant structural feature.

(2) The dome is the predominant positive structural element.

(3) There is a definite relationship between structural "highs" and gas accumulation.

(4) The subsurface structure conforms closely to the surface structure. The tendency is for deformation to be intensified to a certain extent with depth though in places it may be broadened and definite structural features on surface or near surface formations may merge or entirely disappear.

(5) The presence of a number of structural sinks.

(6) The occurrence of dry holes "high on structure" and of producing wells rather far down on the flanks, creating a real problem in the testing of new structures.

(7) The presence of a "shoestring" sand with a definite relation to structure.

(8) The best wells are generally found at the edges of terraces, noses, and anticlines where conditions of porosity and thickness of the sand appear to be most favorably developed.

Origin of Structures

The origin of structural features in the Mid-Continent region, of which Jackson County is a part, has been discussed at great length in the literature on petroleum geology. Many theories have been advanced, among which are the following: tangential compression over buried ridges; initial dips; removal of soluble formations; gravitational compaction of sedimentary rocks; igneous intrusions; folding; and others. The application of any of the above theories to the limited area of Jackson County appears to the writer to be impossible at the present time. The solution to this problem lies in the accumulation of further data, particularly on the pre-Pennsylvanian sediments of the region. As this information accumulates the questions of origin can be more satisfactorily answered and eventually conclusive proof of the origin of these structural features will be forthcoming.

At present, with only the information from shallow drilling available, no definite conclusions regarding the general structural features in the county is justified. The writer believes, however, that the following statements are applicable to the ultimate solution of the problem.

(1) The surface structures in Jackson County are apparently all of post-Pennsylvanian age.

(2) The removal of soluble formations might account for the large number of comparatively small structural features and possibly for their great irregularity of outline.

ECONOMIC GEOLOGY

Summary of Early Oil and Gas Development

The early records of drilling in Jackson County are very meager. The first gas wells were drilled soon after the close of the civil war in the late 60's, but little is known and no logs are available of these early wells. The first well of which there is reliable record was put down near the site of the old union depot in or before 1872. The following table, based on information in the files of the Missouri Geological Survey shows clearly the progress of development and the increase in information available.

TABLE I

Year	Oil	Gas	Dry	Total	Initial Production of oil in Bbls.	Open flow of gas in cubic feet
Drilled to end of 1932	130	781	463	1374	?	?
Drilled 1933-34	2	55	58	115	5	15,401,616
Drilled 1935-36	17	38	58	113	42	12,003,968
Drilled 1937	3	49	36	88	20	48,850,295
Drilled 1938 to April 1	0	27	13	40	0	36,344,880
Totals	152	950	628	1730		

For the years previous to 1932 it is most certainly incomplete, but from that date to the present the record is quite complete and practically all the logs have been obtained by the Survey. In conjunction with the writing of this report, field work was carried on for a period of two years and elevations of all the known wells in the county were procured. The number of wells of which there is record is greater than the total of the above table and this is attributed to loss of logs and other information on many of the wells drilled prior to 1933.

The production from these early wells varied considerably. Wilson[28] reports initial open flows of from 40,000 cubic feet with a gas pressure of 50 to 100 pounds up to 1,500,000 cubic feet with a pressure of 187 pounds. He states also, "that the pressure decreases gradually and the wells last but a few years." A great many small wells were utilized, particularly on farms and in private homes in and near Kansas City, for heating and illuminating purposes. The first commercial distribution of gas from natural sources was at Martin City where one well owned by Mr. Louis H. Knoche supplied the town for several years.

The early production of oil was very small and only two localities are mentioned in previous publications on this

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28. Wilson, M. E., The occurrence of oil and gas in Missouri: Missouri Bur. Geology and Mines, Vol. XVI, 2d ser., p. 146, 1922.

region. One, the Scruggs and Johnson lease in the SW¼, Section 36, Township 47 North, Range 33 West, one-half mile north of the Cass-Jackson county line, had between five and ten producing wells and for a short time the average sale of oil from this lease was 300 barrels a month. The date of this activity is prior to 1912. The other locality is the state line area between Dallas and New Santa Fe. Wilson states [29] "several wells have been drilled in this area during the last few years (prior to 1922) and that an initial production of 50 to 75 barrels per day is reported by the Dallas Oil and Gas Company".

The earliest figures available on the total number of wells drilled are those of Wilson[30]. He estimates that 100 to 150 wells had been drilled to that date (1922). Even taking into consideration the fact that this is probably a very low figure. It is easily seen from the preceding table that the greater portion of development has occurred in the last ten years. For this reason the detailed discussion of development deals with the more recent discoveries from which complete information is available. This discussion will be taken up by townships in order to facilitate location of the various pools.

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29. Wilson, idem. p. 147.
30. Wilson, op. cit. p. 145.

Township 47 North, Ranges 32 and 33 West

The only commercial oil pools in Jackson County are located in this area. There are also two very productive gas fields and many small scattered oil and gas wells.

Outcropping Formations:

In this area, which has a surface relief of over 300 feet, the uplands are capped by Iola limestone and the top of the Pleasanton is exposed in the valley of Big Blue River. In the intervening space the entire thickness of the Kanasas City formation outcrops.

Producing Horizons:

Gas is encountered in the Wayside sand, the marginal phase of the Warrensburg, the Peru sand, the Lexington coal shale, the Squirrel sand, and the so-called Bartlesville sand. Wells on the upland that start in the Iola limestone reach the Lexington coal horizon at around 500 feet, the top of the Squirrel sand zone at 525 to 540 feet and the top of the so-called Bartlesville at about 650 feet. Oil is found only in the upper and lower part of the Squirrel sand zone.

The two gas fields lie to the east and west of the town of Grandview and they are designated as the East and West Grandview gas fields. The East Grandview field in Sections 13, 24, and 25, Township 47 North, Range 33 West, and Sections 17,

18, 19, and 20, Township 47 North, Range 32 West, is much the larger of the two. With depletion of the Squirrel gas, deeper drilling to the so-called Bartlesville sand encountered additional production and several wells in the field are still producing from this horizon. At the present time, however, production from the so-called Bartlesville is confined to the western portion of the field and there is a long narrow area on top the dome in which no wells have been drilled. The Sol Chiles well (Map No. 48) SW¼ Section 19, Township 47 North, Range 32 West, penetrated the Burgess sand horizon but failed to get any gas. It did, however, encounter salt water. This well is located high structurally but was drilled after wells in the Squirrel horizon on the same lease were abandoned. There are no production figures available from this field.

The West Grandview field lies in Sections 3, 4, 10 and 15, Township 47 North, Range 33 West. It is the first commercial pool in the county producing from the Peru sand. The field was opened in September 1933 and initial production of more than 1,000,000 cubic feet was reported from several wells. This is rather large for wells producing from this horizon. Additional development occurred in 1934 and a total of twelve gas wells and seven dry holes have been drilled. Nearly all the gas is from the Peru sand and attempts to obtain further production from the Squirrel sand and the so-called

Bartlesville have been disappointing. The field is now abandoned and all wells have been salvaged. Production statistics on the pool are not available.

The five oil pools within the area are as follows: (1) Carlson pool, E½ Sec. 21, T. 47 N., R. 33 W., (2) Wells pool, NE¼ Sec. 21, and SE¼ Sec. 16, T. 47 N., R. 33 W., (3) Duck pool, NW¼ Sec. 16, T. 47 N., R. 33 W., (4) Klapmeyer pool, W½ Sec. 9, T. 47 N., R. 33 W., and (5) Lester pool, SE¼ Sec. 6, and NE¼ sec. 7, T. 47 N., R. 33 W.

The information available on the Carlson, Wells, and Duck pools is meager. There are no production figures, but because of their close relationship to the Klapmeyer and Lester pools it is logical to assume that the initial production and recovery would approximate the figures given for these pools.

Production Statistics:

The statistics for the Klapmeyer and Lester pools are quite complete and are presented here in order to give future operators some idea of what to expect from shallow oil wells in this region. The initial production of wells in the two pools averages 4 to 5 barrels per day. The wells soon lose this initial flush, however, and settle down to a steady production of one to two barrels per day.

Production of oil from the Klapmeyer pool started in 1931 with 25 wells and continued with these original wells until

1936. In August of that year two additional wells were drilled and two more were drilled early in 1937 making a total of 29 wells in the pool. The addition of these wells, together with an air repressuring project instituted in 1936, accounts for the increase in 1937. The success of repressuring is still questionable. Mr. Judd, the operator of the pool says, "The chief result so far is the maintenance of production at a constant level."

The following table shows the production in barrels per year for the pool:

TABLE II

Year	Production of Oil in Bbls.
1931	15,110
1932	13,675
1933	13,397
1934	11,179
1935	8,331
1936	7,767
1937	8,184
Total	77,643

The total value of all the oil produced, based on an average of $0.86 per barrel is $67,066.08.

The Lester pool is smaller with a total of 14 producing wells. Pumping did not start in this pool until 1932 though oil had been produced from the surrounding area for many years. The following table gives production in barrels per year for the pool:

TABLE III

Year	Production of Oil in Bbls.
1932	11,452
1933	5,969
1934	4,321
1935	2,855
1936	1,642
1937	1,518
Total	27,757

The total value of all oil produced is $23,597.00. The production from this pool has been considerably less than from the Klapmeyer pool and the writer believes that this is due to exploitation of the region prior to 1932. The rate of production is declining slowly and the pool will probably reach depletion before the Klapmeyer pool.

In addition to the wells in the pools previously described there are many private ones and numerous dry holes scattered over the entire region. The logs of these wells provide

information otherwise unobtainable and hence are of considerable value in the development of the region. The following table summarizes drilling activities in the area under discussion:

TABLE IV

	T.47 N R.32 W	T.47 N R.33 W	TOTAL
Total Number of Wells of Which there is Record	63	288	351
Logs of Wells on File	53	244	297
Gas	14	65	79
Oil	0	96	96
Water	5	10	15
Dry Holes	34	73	107

Future Development:

The future of this area is highly problematical. Deeper drilling in any of the older fields may encounter additional gas or oil or both, but as yet it has not been attempted except in the East Grandview field. Further work in repressuring, either by air or water flooding methods, might revive the oil pools and the writer recommends operators investigate repressuring more thoroughly. The gas fields of the region are being rapidly depleted and only the so-called Bartlesville sand wells are still producing gas for commercial consumption. The possibility of

further production appears to rest entirely on deeper drilling. The majority of the area in Range 32 West is open for further prospecting. The structure maps (Plate I and II) show the lack of information in the area and it is entirely possible that detailed surface mapping might discover several structures in the area that are not indicated on the maps of this report.

Township 47 North, Range 31 West

This area has one small commercial gas field and a few scattered private gas wells. In addition there are a number of dry holes, one of which penetrated pre-Cambrian rocks.

Outcropping Formations:

The outcropping formations range from the Iola limestone to the Bethany Falls limestone of the Kansas City formation. Most of the wells in the Lees Summit pool start in the Iola limestone or high up in the Chanute shale while wells in other parts of the area begin slightly lower down in the section.

Producing Horizons:

The only commercial production is from the Warrensburg Channel sandstone which is well developed particularly in the Lees Summit area. The Squirrel sand is absent beneath the Lees Summit pool and deeper formations fail to show sand bodies of any magnitude. Wells in the remainder of the region, however, have penetrated practically normal sand sections.

Production Statistics:

The Lees Summit townsite pool lies in Sections 5, 6, 7, and 8, Township 47 North, Range 31 West. This field affords the second instance of both gas and oil in commercial quantities in the same field. The pool was first opened by private drilling for home consumption in 1927. Soon, however, the Lees Summit

Gas Company leased and drilled all available locations and began supplying the town with gas.

Since practically all the gas produced was carried by the Company pipe lines fairly accurate production figures for the pool are available. The only gas not accounted for is from private wells which were never used commercially, and that which was consumed by the property owner, unmetered, as part of the lease contract. The total initial open flow of 32 out of 39 producing wells used commercially was 14,646,000 cubic feet. The open flow figures from the other wells are not available but all were small private wells.

The following table gives the total production for the pool:

TABLE V

Year	Production of Gas in Cu. Ft.
1928	5,815,200
1929	34,296,900
1930	49,272,000
1931	43,815,200
1932	29,602,220
1933	3,185,300
Total	165,981,820

At the end of 1933, the gas company abandoned the wells and after attempts by land owners to continue their use for private consumption, proved unsuccessful, they were salvaged. At this time only two of the private wells remain in use. The records of oil production are not available but the wells are all small and total production cannot be very large. Five wells are still being pumped intermittently.

Special Features:

The total absence of the Squirrel sand beneath this pool is noteworthy. It is not unusual, however, since the absence of sand seems to be consistent throughout the Cherokee section in this area. The log of the Kenton well (Map No. 86) NE¼ SW¼ Section 7, Township 47 North, Range 31 West, shows only two very thin streaks of sand in the entire Cherokee formation. This absence of sand indicates that in this particular area, at least, muddy water conditions persisted throughout the deposition of the Cherokee. The production of gas and oil from the Warrensburg sand in closely spaced wells is also worthy of mention.

The remainder of this region has been but slightly prospected. The records show only 17 wells located outside of the Lees Summit townsite pool. Of this number, five were small gas wells and the others dry holes or water wells. The producing horizons are similar to those of the Lees Summit pool

except the Squirrel, so-called Bartlesville and Burgess sands are present, thus indicating that the muddy water was confined to a rather small part of this region. The Phil K. Toll well (Map No. 99), SE¼ NW¼ SE¼, Section 29, Township 47 North, Range 31 West, is the deepest hole in the township. It penetrated pre-Cambrian rocks at 2214 feet and is one of the three "granite" wells in Jackson County. The log shows 80 feet of sand at the St. Peter (Wilcox?) horizon with a showing of water. The logs of the two gas wells are not in the files but their location indicates that they are well up on top of the Lees Summit nose. The following table summarizes drilling in the townsite pool and the remainder of the Range.

TABLE VI

	LEES SUMMIT POOL	REMAINDER OF RANGE	TOTAL
Total Number of Wells of Which there is Record	93	17	110
Logs of Wells on File	71	12	83
Gas	54	5	59
Oil	15	0	15
Water	1	1	2
Dry	22	11	33

Future Development:

The Lees Summit pool is depleted and except for the small oil wells is completely abandoned. The absence of good sand precludes the possibility of further production from lower horizons. The future of the remainder of this range rests on further prospecting and detailed surface mapping to discover new structures.

Township 47 North, Ranges 29 and 30 West

This area contains three small commercial gas fields, a group of small gas wells that have never been used commercially and the usual scattering of dry holes and water wells.

Outcropping Formations:

Practically the entire area is underlain by the lower three members of the Kansas City formation and in a few places in the Knorpp pool small outliers of the overlying Cherryvale shale remain. In other places the larger streams have cut down into the top of the Pleasanton.

Producing Horizons:

The Wayside sand is the first horizon penetrated that shows gas but it is insignificant in quantity. The main production in the Knorpp pool comes either from the Squirrel sand or the Warrensburg Channel sand which trends in a northwest-southeast direction across Sections 32 and 33, Township 47 North, Range 30 West. The Channel sand here has a maximum thickness of 70 feet. It generally rests on the limestone below the Lexington coal horizon but where the maximum thickness is developed even this has been cut out. The Squirrel sand is well developed, one of the wells penetrating 80 feet of sand at this horizon. In the Shawhan and Lone Jack pools the main production is also from the Squirrel sand but the Channel sand is missing. Some gas is also found in the black shales at the

Lexington, Summit and Mulky coal horizons. One well (Map No. 86) Ott Clark No. 7, SE¼ NW¼ NE¼, Section 32, Township 47 North, Range 30 West, in the Knorpp pool was drilled to the Mississippian limestone. The log shows 95 feet of sand and shale at the so-called Bartlesville horizon and 35 feet of Burgess sand, though neither was productive. Two wells were drilled to the "Lime" in the Shawhan pool and in one, D. Lee Shawhan No. 6 (Map No. 23), NW¼ SE¼ SE¼, Section 14, Township 47 North, Range 30 West, drilling was finally stopped at 1265 feet. The so-called Bartlesville sand was absent and the Burgess carried water.

The gas from the three pools is purchased by the Interstate Gas Company of Harrisonville, Missouri and since production records of the three are combined they will be considered as one in this discussion. The Knorpp pool lies in Sections 32 and 33, Township 47 North, Range 30 West, and extends south over the county line into Sections 4 and 5, Township 46 North, Range 30 West, in Cass County. For this reason production records include gas from 10 wells that are not located in Jackson County though a part of this pool. The Shawhan pool covers parts of Sections 13, 14, 23, and 24, Township 47 North, Range 30 West, and the Lone Jack pool lies along the range line in Sections 19 and 30, Township 47 North, Range 29 West, and Sections 24 and 25, Township 47 North, Range 30 West. The pools were not connected until 1930 though the

discovery well in the Shawhan pool was drilled in 1925 and in the Knorpp pool in 1929. There were a total of 120 wells drilled in the three pools, 89 of them producing gas and 31 being dry holes. In the Knorpp pool 8 were completed as small oil wells in the Warrensburg Channel sand but were soon abandoned.

Production Statistics:

The production figures from these three pools are rather startling in that the total initial open flow was never very large considering the number of wells, and the life of the pools has been much longer than would normally be expected from the size of the wells. The total initial open flow early in 1930 was 10,883,652 cubic feet. This was increased by drilling additional wells so that on November 5, 1930, with a total of 49 producing wells, the total open flow was 11,542,000 cubic feet, the maximum figure for the pools. The decline of open flow was rather rapid and September 17, 1934 the open flow was only 1,103,938 cubic feet. Despite continued decrease of open flow and the fact that the reservoir pressure had declined to 8 pounds at the end of 1937, 20 wells were still producing. The following table gives the total production for the three pools to the end of 1937:

TABLE VII

Year	Production of Gas in Cu. Ft.
1930	61,816,000
1931	67,616,000
1932	73,543,000
1933	56,023,000
1934	44,752,000
1935	18,920,000
1936	7,612,000
1937	5,289,000
Total	335,571,000

In addition to these pools there are several small gas wells on the elongated Adams Cemetery anticline in Sections 3, 10, 9, 8, and 17, Township 47 North, Range 30 West. The wells are rather small and have never been used commercially. Outcropping formations are the same as those in the other parts of the area previously described. Production is mainly from the Squirrel sand and as yet no wells have been drilled to deeper horizons in this part of the range.

Future Development:

The three commercial pools, although still producing some gas are slowly approaching total depletion. There is little possibility of production from lower formations because deep

tests on these structures, though well located structurally, have failed to obtain any gas. The future of the Adams Cemetery anticline will be considered later. The following table gives a summary of drilling in the region:

TABLE VIIA

	T.47 N R.29 W	T.47 N R.30 W	TOTAL
Total Number of Wells of Which there is Record	18	132	150
Logs of Wells on File	16	120	136
Gas	5	71	76
Oil	0	8	8
Water	4	6	10
Dry Holes	9	35	44

Township 48 North, Ranges 31 and 32 West

These ranges comprise the area previously published and described in detail under the title, "Geology of the Blue Springs Gas Field".[31] It is unnecessary, therefore, to discuss further its location, outcropping formations, producing horizons and other features. However, the writer believes it worthwhile to again call attention to the Warrensburg Channel sandstone. It was in this area that its true relationship to the surrounding beds in Jackson County was first definitely recognized. Bartle[32] discussed at considerable length the importance both economic and stratigraphic, of this discovery and suggested that it seemed logical to place the contact between the Des Moines and and the Missouri groups at this unconformity. Previously it had been drawn at the base of the Kansas City formation on the basis of change in lithology. After careful study of the problem in the light of additional information, leading geologists in this part of the Mid-Continent region are now agreed that the boundary between the Des Moines and the Missouri groups should logically be placed at this horizon.

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31. Bartle, Glenn G., Geology of the Blue Springs Gas field: Missouri Bur. Geology and Mines, 57th Bienn. Rept. App. III, p. 64, 1933
32. Bartle, idem., p. 18.

Production Statistics:

Since almost the entire production from this field has been handled by one company, the Panhandle Eastern Pipe Line Company, unusually complete statistics are available from the company records. The gas produced and used by the Knobtown Development Company was added to the original figures of Bartles report. The only gas not accounted for in these figures is that which is used by the landowner, unmetered, as a part of the lease contract, leakage and line loss, and loss due to "blowing off" while gauging wells or cleaning them of excess water. Bartle[33] says, however, that the total amount produced is probably less than 10 per cent greater than the production figures show.

The Blue Springs field was divided into districts based upon the date of connection of wells to the main line system. Since records of the Panhandle Eastern Pipe Line Company show the production for such districts the same subdivisions will be used in this report. The West district includes all of the wells on the Bannister Ridge anticline of this report. The East and Northeast districts include all of the wells on the Blue Springs anticline, except those on the Ritter nose. The South district covers those wells on the Ritter nose.

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33. Bartle, op. cit., p. 35.

Using the "Production Decline Curve Method" Bartle[34] estimated the expected future production of the field after January 1, 1932. Comparing these estimates with the actual production of the field to March 22, 1938 a considerable discrepancy is noticed. To January 1, 1932 the East and Northeast districts, with a total initial open flow of 36,870,000 cubic feet, had produced a total of 974,280,000 cubic feet of gas. Based on extrapolation of Decline Curves he estimated that an additional 440,000,000 cubic feet would be produced, making a total of 1,414,280,000 cubic feet before abandonment. To March 22, 1938, these districts had produced a total of 1,673,006,000 cubic feet and 8 wells were still on the lines showing that Bartle's estimate was 258,726,000 cubic feet too low. The South district, with an open flow of 12,208,000 cubic feet, on January 1, 1932 had produced 117,862,000 cubic feet and it was estimated that it might be expected to produce 52,000,000 cubic feet additional. This district has since reached depletion and the final total production of 227,509,000 cubic feet exceeds Bartle's estimate by 57,647,000 cubic feet. The large West district or Bannister Ridge portion of the field, with an open flow of 47,848,000 cubic feet, had produced 2,439,211,000 cubic

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34. Bartle, idem., p. 38.

feet of gas up to January 1, 1932, and it was estimated that it might be expected to produce an additional 172,000,000 cubic feet or a total of 2,611,211,000 cubic feet before total depletion. The total production to March 22, 1938 is 3,151,071,000 cubic feet with 25 wells still producing. This figure is 539,860,000 cubic feet larger than the estimate. The total production from the entire field to March 22 was 5,051,586,000 cubic feet, which is 856,233,000 cubic feet more than Bartle's estimated figure of 4,195,355,000 cubic feet total production before abandonment.

The principal fact indicated by these figures is that any method of evaluating gas field reserves now in use gives figures considerably smaller than actual total recovery. The figures also vindicate Bartle, in that the estimates he made were severly criticized as being much too high.[35] The following table summarizes drilling in the two ranges. It also includes wells from the Blue Ridge gas field part of which lies in Sections 1 and 2, Township 48 North, Range 32 West:

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35. Stephenson, Eugene A., Review of The Geology of the Blue Springs gas field, Jackson County, Missouri by Glenn G. Bartle: Amer. Assoc. Petroleum Geologists, Bull. 17, No. 9, p. 1148, September 1933.

TABLE VIII

	T.48 N R.31 W	T.48 N R.32 W	TOTAL
Total Number of Wells of Which there is Record	170	358	528
Logs of Wells on File	161	293	454
Gas	92	211	303
Oil	0	2	2
Water	3	5	8
Dry Holes	66	75	141

Future Development:

The future of this region does not appear very promising. In the West district (Bannister Ridge anticline) there have been several attempts in the last year to secure production from the so-called Bartlesville sand. They have meet with only mediocre success and for the present, at least, no further drilling is contemplated. On the Blue Springs anticline there are only three wells which have penetrated the so-called Bartlesville horizon. Although two of these were favorably located structurally, only one produced a very small amount of gas. The other, Graves 1-B (Map No. 52), on the Graves dome, SE¼, Section 14, Township 48 North, Range 31 West, located 1200 feet north

of the aforementioned gas well, penetrated 145 feet of sand at this horizon but showed no gas. It also had good sand at the Burgess horizon. The third well, Oscar Boten No. 1 (Map No. 116) NW¼ SW¼, Section 28, Township 48 North, Range 31 West, is low on the east flank of the Ritter nose and did not have any sand at the so-called Bartlesville horizon. However, the log shows 35 feet of water bearing sand at the Burgess horizon. In spite of these failures it is entirely possible that an occasional well favorably located might obtain production from these lower formations.

Township 49 North, Range 32 West

There are three commercial gas pools located in this region, one of which is reaching the proportions of a major gas field. In addition there are a number of scattered private wells and a small group of shallow wells which were used to supply several private homes.

The Centropolis pool lies in Sections 6 and 7, Township 49 North, Range 32 West, entirely within the valley of the Big Blue River. Alluvium covers the whole area and none of the older formations show at the surface.

Producing Horizons:

Production is from the Squirrel sand and the so-called Bartlesville sand. Since the field lies in the river valley, wells penetrate these horizons at considerably shallower depths than in the upland pools.

The first wells were drilled by industrial firms for use in manufacturing. This development was about 1910 and for several years gas was used by a number of factories. In 1929 the Prior Brass Company had trouble with their first well, so they drilled another,deepening it to the so-called Bartlesville sand. The initial open flow from this well (1,039,000 cubic feet) was so much larger than the others in the vicinity which were producing from the Squirrel sand, that it attracted commercial

operators and a number of additional wells were drilled. The Cities Service Company laid a connection to the field and purchased gas from a few wells. However, the structure is rather small and the life of the wells has been comparatively short. All the commercial wells have been abandoned and the remaining private wells produce a very small amount of gas. This was the first commercial field in Jackson County producing gas from the so-called Bartlesville horizon. There are no accurate production statistics available since most of the gas was used privately.

Future Development:

The pool has practically reached depletion and the possibility of further development from it is not very promising. The Squirrel and so-called Bartlesville have been depleted and though there are no wells penetrating the Burgess sand it seems unlikely that this horizon will produce.

The Kline pool lies in Section 8, Township 49 North, Range 32 West. It is a very small pool and only two wells have been connected to the pipe line.

Outcropping Formations:

The outcropping rocks, all are in the Kansas City formation ranging from the upper part of the Chanute shale (Raytown limestone) to the Bethany Falls limestone.

Producing Horizons:

Gas is encountered in the Wayside sand, the Peru sand, the Lexington coal shale, and the Squirrel sand. One well, Kline No. 3 (Map No. 60), NE¼ NW¼, Section 8, Township 49 North, Range 32 West, was drilled to the so-called Bartlesville sand but failed to obtain further production and was plugged back to the Squirrel sand.

Production Statistics:

The first wells in this pool were drilled in 1932. Only two of four producing wells have been connected to the pipe line and considering the initial size of these wells, the amount of gas they have produced is rather remarkable. Kibby well No. 1 (Map No. 56), NW¼ SE¼ NW¼, Section 8, Township 49 North, Range 30 West, was connected to the line late in 1932. It had an initial open flow of 180,000 cubic feet considered extremely small for a commercial well. However, despite the small open flow, this well had produced a total of 52,232,000 cubic feet of gas to March 22, 1938, an average of 28,619 cubic feet per day over a period of five years. The other well, Kline No. 1 (Map No. 57), NW¼ NE¼ NW¼, Section 8, Township 49 North, Range 32 West, with an initial open flow of 480,000 cubic feet had produced 64,556,000 cubic feet of gas to March 22. Both wells are still connected working against line pressure so they may be expected to continue to produce gas for sometime to come.

Future Development:

The future of this pool is highly problematical. The absence of sand at the so-called Bartlesville horizon precludes production from this zone. Since there has been no production from lower formations in other pools and because this structure has little closure, it does not appear advisable to test them here.

The Blue Ridge gas field, the most recent development in the county, lies in Sections 18, 17, 16, 22, 21, 27, 34 and 35, Township 49 North, Range 32 West, and Sections 1 and 2, Township 48 North, Range 32 West. It is composed of three pools disconnected on the surface structure maps but becoming more closely related with increasing depth. These pools will be discussed separately and their relationship as shown on the subsurface maps will be explained.

Outcropping Formations:

The outcropping formations range from the top of the Iola limestone to the upper part of the Pleasanton shale and in any one pool there is little variation. The southern portion of the field lies in the valley of the Little Blue River and hence wells in this part start rather far down in the Pleasanton.

Producing Horizons:

The main production in the western part of the field

Plate XXVI

Drilling in the Blue Ridge Gas Field

is from the Squirrel sand, however, many of the wells encountered gas in the Wayside, Warrensburg Channel and Peru sands and also in the Lexington coal shale and several of these flows were large enough to justify their utilization. The Burbank sand was discovered in this western area but its shoestring character was not realized until later. This sand is the main producing horizon for the east and southeast portions of the field. The Squirrel sand is unusually well developed particularly in the Marotta pool. The logs of several wells that have penetrated the entire thickness showing from 90 to 100 feet of sand in that area.

The Marotta pool in Sections 17 and 18, Township 49 North, Range 32 West, although a new development commercially, has produced gas from shallow wells for private use for many years. Mr. F. E. Davis deepened an old well, Marotta No. 2 (Map No. 109), NE¼ SW¼ Section 17, Township 49 North, Range 32 West, from the Peru to the Squirrel sand in April 1934. It was completed at a depth of 478 feet with an initial open flow of 450,000 cubic feet. Subsequent drilling outlined the dome and at the time of publication of the original structure map[36] of the pool, it was thought to be closely related to the older Kline pool in Section 8, Township 49 North, Range 32 West.

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36. Greene, F. C., Oil and gas developments in Missouri, 1933-34: Missouri Geological Survey and Water Resources, 58th Bienn. Rept., App. III, p. 13, 1935.

Plate XXVII A

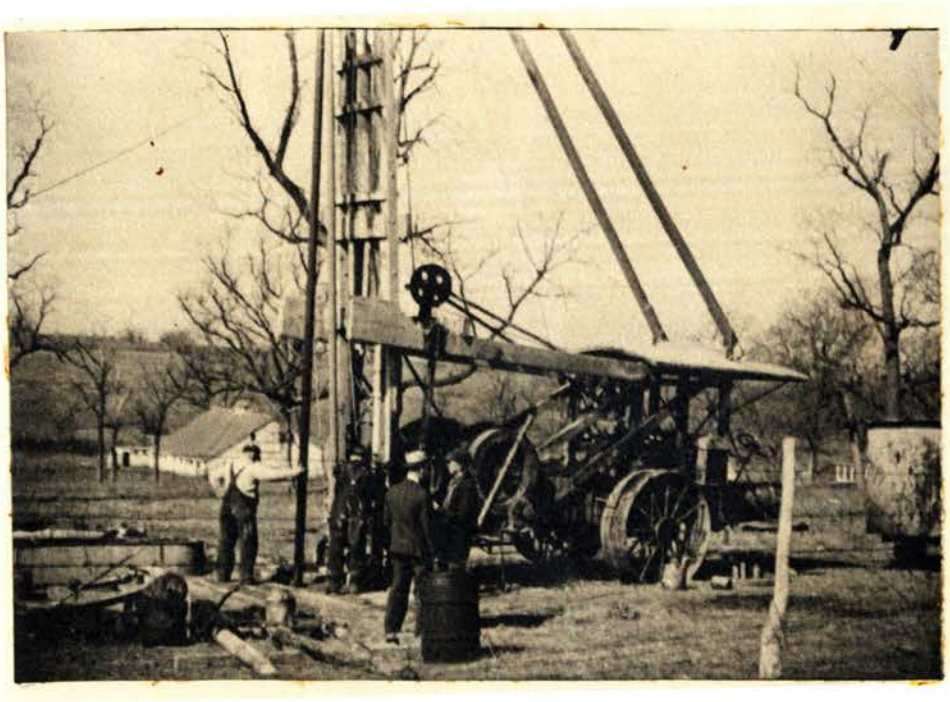
Plate XXVII B

Typical Drill Rigs

Further information, however, has proved this to be incorrect and that they really separated by a rather sharp syncline. Thirteen wells were originally drilled to the Squirrel sand, nine of which were producers and four (including one, Denton No. 1 (Map No. 102) previously drilled a short distance south of the pool), were dry. Subsequently three more wells were drilled to the Squirrel sand and then an attempt was made to obtain production from the so-called Bartlesville sand. The first well drilled to this horizon, Wm. Wilson No. 1 (Map No. 119), NW¼ SW¼, Section 17, Township 49 North, Range 32 West, obtained production from a sand about 50 feet below the Ardmore limestone which was correlated at that time with the so-called Bartlesville. More recent information shows that it should be correlated with the Burbank sand of Oklahoma and Kansas.

The largest producing well from the Squirrel sand is Woodson No. 1 (Map No. 124), SE¼ NW¼, Section 17, Township 49 North, Range 32 West, with an initial open flow of 1,100,000 cubic feet. The largest well in the pool is Woodson No. 2 (Map No. 125), producing from the Burbank sand with an initial open flow of 2,000,000 cubic feet. The field is by no means exhausted and the following production figures show what the field has already produced compared with its initial flow. The total initial open flow for 20 wells was 10,015,000 cubic feet. The field was connected August 21, 1934 and from that

Plate XXVIII



"Bailing Out"

date to March 22, 1938 had produced 440,506,000 cubic feet. Altogether there have been 34 wells drilled, ten of which produced from the Squirrel, twelve from the Burbank, two from the Peru, one from a black shale in the Cherokee and nine were dry holes.

The Logan pool lies in Sections 16 and 21, Township 49 North, Range 32 West. It was located as a result of surface mapping by the writer, although there was little indication of the structure that subsequent drilling revealed. The development has been similar to that of the Marotta pool though there are fewer wells producing from the Squirrel sand. The initial volume of the wells was comparable to the volume of wells in the Marotta pool. The essential difference between the pools is that the Squirrel sand in the Logan pool is dry while in the Marotta pool it carried water and that the sand is much thinner in the eastern part of the Logan pool. The discovery well, Logan No. 1 (Map No. 88) NE¼ SW¼, Section 16, Township 49 North, Range 32 West, had an initial open flow of 552,000 cubic feet at the depth of 404 feet. Since the field is being developed production figures are of no particular value.

The remainder of the Blue Ridge gas field is called the Sni-A-Bar Gardens pool. However, since development in this pool disclosed the Burbank "shoestring sand", discussion of the pool will be combined with that of the sand in the next paragraph.

Plate XXIX

Sharpening a Drill Bit

The Shoe-string Sand of the Blue Ridge Gas Field:

The chief stratigraphic irregularity of this field is a shoe-string sand with a definite relationship to the structure of the area.

The shoe-string like distribution of belts of Burbank and Bartlesville sand in Kansas and Oklahoma led Bass and others[37] to the conclusion that their origin was restricted to two probable types of deposits, filled stream channels and off-shore bars. They further concluded that the Burbank and Bartlesville sands were deposited as systems of off-shore bars on the western shore of an arm of the Cherokee sea, because of the following facts: (1) the areal distribution of the sand bodies in narrow, nearly straight lines; (2) the offset arrangement of the individual sand bodies within the systems; (3) the gaps between the sand bodies; (4) the occurrence of features believed to represent beach growth ridges; (5) the probable original slope of the bases of many of the sand bodies; (6) the narrow, elongate, lens-like forms and bar shape, particularly the convex top known to characterize many sand bodies; (7) the composition of the sands

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37. Bass, N. W., Leatherock, Constance, Dillard, W. R., and Kennedy, L. E., Origin and distribution of Bartlesville and Burbank shoe-string oil sands in parts of Oklahoma and Kansas: Reprint, Amer. Assoc. Petro. Geologists, Bull. 21, No. I, p. 55, Jan. 1937.

and their physical characters, such as sorting and shapes of grains; (8) the types of bedding; and (9) the occurrence of marine fossils.

The possibility that the producing sand in the Sni-A-Bar Gardens pool in Sections 22, 27, 34, and 35, Township 49 North, Range 32 West and Sections 1 and 2, Township 48 North, Range 32 West, is a shoe-string sand first occurred to the writer while studying logs for use in preparing the structure contour maps for this report. The writer had been responsible for the surface mapping in this field and it was largely at his insistence that the discovery well, Sni-A-Bar Gardens No. 2 (Map No. 151), NW¼ SE¼, Section 27, Township 49 North, Range 32 West, was deepened below the Squirrel sand zone when this horizon failed to produce gas. Since this was a private well, drilling was stopped after sufficient gas for the owners needs had been obtained.* Subsequent deepening of an old well, Melcher No. 1 (Map No. 142), NW¼ SE¼, Section 27, Township 49 North, Range 32 West, led to commercial development of the field and discovery of the true character of the producing sand.

* A commercial well, Davis and Johnson, Sni-A-Bar Gardens No. 1 (Map No. 219) was drilled within 300 feet of the above well, later in the development of the pool. It had an initial open flow of 4,500,000 cubic feet, the second largest in the state, further substantiating the writers work in the area.

Plate XXX

Tubing up Missouri's 2nd. Biggest Gas Well
4,500,00 cubic feet
Davis & Johnson, Sni-A-Bar Gardens No. 1
Sec. 27, T. 49 N., R. 32 W.

The distribution of producing wells in a narrow belt together with the similarity of this belt to those of the Burbanks sand in Oklahoma and Kansas and its close correlation to the stratigraphic position of the Burbank led the writer, rather early in the development of the field, to correlate the producing sand of the Sni-A-Bar Gardens pool with that stratigraphic horizon.

The Logan pool was reopened when two wells in the syncline between the Marotta and Logan pools produced gas from a sand at the same stratigraphic horizon as the Burbank sand in the Sni-A-Bar Gardens pool. Further development of this sand in the Logan pool, strengthened the writers belief that it was a shoe-string sand and led to a closer study of logs from the Marotta pool, disclosing the fact that the lower producing horizon there, originally correlated with the so-called Bartlesville was in reality the Burbank sand.

Additional drilling in the southern and northen parts of the Sni-A-Bar Gardens pool provided more evidence of the shoestring character of this sand body and further disclosed its actual coincidence with the structure of the field.

The work of Bass[38] and others on the shoe-string sands of Kansas has established definite proof of their complete lack

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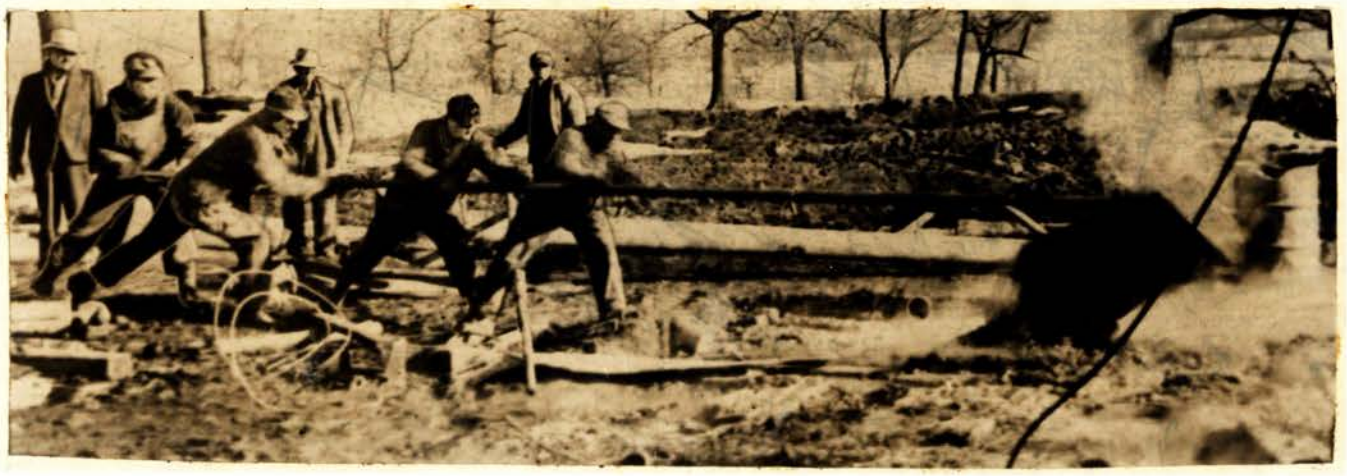
38. Bass, N. W., Origin of the shoestring sands of Greenwood and Butler Counties, Kansas: Univ. of Kans. Bull. No. 23, Vol. 37, No. 18, p. 56, 1937.

Plate XXXI

A Gas Well on Fire, Ida Witte #2, NE Sec. 22, T. 49 N., R. 32 W.

Plate XXXII



Extinguishing the blaze at Witte #2.

of coincidence with structure. In fact Bass says that the structure contours are not deflected when they cross the area underlain by the sand body, and the minor structural features such as synclines and anticlines show no deviations from the normal in crossing the area. He says further[39] that the surface structural features appear to lack any suggestion of conformation with the shape of the buried sand bodies throughout so large a part of their extent that the few exceptions where they do, are believed to be the result of chance.

With these facts in mind it is evident that the partial conformity of surface structure with shoe-string sands in the Blue Ridge gas field is something entirely new in the history of such deposits. The question immediately arises as to whether this shoe-string sand is an offshore bar type of deposit similar to those found in Oklahoma and Kansas. This question is difficult to answer, and is further complicated by the fact that in parts of the field the shoe-string does not coincide with the structure. The accompanying large scale maps give a better picture of the conformity between the sand and the structure than would be possible on the smaller scale maps of the county. Maps III and IV show the structureof the

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39. Bass, idem., p. 60.

area covered by the field with structural control from only those wells that have penetrated the Burbank horizon. Map III is based on elevations on top of the Bethany Falls limestone and Map IV on elevations on the base of Lexington Coal "Cap Rock". Map V is contoured from elevations on top the shoe-string sand. In addition, on Maps III and IV the outline of the sand body and its top contour have been superimposed in colored ink.

Map V shows plainly the bar-like outline of the sand body, particularly that portion of it which lies to the south and east of Section 22; it also shows the offset arrangement of the two portions of the sand body which are separated by a narrow gap in which the sand is missing. Such gaps are typical of shoe-string sands in Kansas and Oklahoma and also of recent offshore bars of the Atlantic Coast. The chief difference between this shoe-string and those in Kansas and Oklahoma is the width, the one under consideration being very narrow in comparison with those in the above mentioned areas. In its other characteristics, however, it coincides quite closely. The top of the sand is convex upward and the slope is steep to the south and west and more gradual to the north and east. Only one well, Martha Wilson No. 3 (Map No. 115) NW¼ Section 17, Township 49 North, Range 32 West, has penetrated the entire thickness of the bar so that information concerning the attitude

of its base is not available. The total thickness, of sand penetrated in this well was 74 feet which is very close to the average thickness of shoe-string sands in Kansas and Oklahoma. Cross-sections of the sand body show that the top of the sand grades into shale on both sides and that red shale occupies the horizon of the top of the sand in wells off the edge of the shoe-string. Bass[40] notes the persistent occurrence of red shale at about the stratigraphic position of the shoe-string sand, in wells where the sand is missing, in Greenwood and Butler counties, Kansas. The shoe-string has secondary ridges that are higher than other parts of the sand body indicating growth at different stages. This feature is quite common in present day off-shore bars. The shoe-string is wider at the bottom than at the top indicating that it is not a stream filled channel. The knowledge of physical characters of the sand body is rather limited because of the lack of samples. However, the information available indicates that the size of grain, degree of sorting, types of material, and heavy mineral assortment are very similar to those in the shoe-string sands of Kansas. The stringer, developing in Section 21, is typical of this type of deposit both in Kansas and in recent offshore bars. Checking the above facts against the conclusions of Bass and others the evidence is

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40. Bass, N. W., op. cit. p. 22-24.

overwhelmingly in favor of offshore bar type of deposition. Reference to Maps III and IV, however, shows close conformity to structure, a feature unknown in any such type of deposit previously described. The present occurrence certainly cannot be attributed to chance because the close coincidence is in evidence for a considerable distance.

In the Logan pool in Section 16, a well, Logan No. 2 (Map No. 195), twin to the discovery well, Logan No. 1 (Map No. 88), is estimated to be the largest gas well in the state with an initial volume in excess of 5,000,000 cubic feet. There is considerable difference of opinion, however, as to whether it has actually reached the Burbank sand. The structure of the pool based on the Lexington Cap Rock is rather sharp (Map IV). If this well has actually penetrated the Burbank sand, the structural deformation as seen on Map V is very evidently greater than on either the Lexington or the Bethany Falls structure maps. The chief argument against its ever having reached the Burbank lies in the fact that the well pressure* is only 75 pounds, the normal pressure for Squirrel sand wells,

* The pressure of the wells as gauged has always been considered to be rock pressure, but this is a misnomer. It is really well pressure or casing head pressure and according to Heroy[41] in the case of a reservoir yielding only gas, the pressure indicated at the casing head, will in the absence of leakage, be the same as the pressure in the sand itself and will consequently be identical with the reservoir pressure.

41. Heroy, W. B., Rock Pressure: Bull. Amer. Assoc. Petro. Geologists, Vol. 12, No. 4, p. 368, April 1928.

while the normal pressure for the Burbank sand is 145 to 150 pounds. On the other hand, in view of the secondary ridges in other parts of the shoe-string, it is entirely possible that deposition might have been continuous on this portion of the bar from Burbank to Squirrel time. Deepening of this well is necessary before the question can be accurately answered.

The shoe-string crosses the syncline separating the Logan and Marotta pools, still coinciding in general to the structure of the area, finally being replaced by shale to the west in Section 18, Township 49 North, Range 32 West. To the east of Logan No. 2 in Section 16, it apparently bends sharply to the southwest and a gap devoid of sand divides the sand body. This is the first place where it does not coincide with the structure, but the gap is indicated by the structure contours on Map IV and the extension of the stringer to the southwest from the main sand body is also slightly indicated. The coincidence between sand body and structure is best seen in Sections 22, 27, and 34 where the conformity is practically perfect. In the SW¼ of Section 34 and SE¼ of Section 35, the sand again deviates slightly from the structure. Then after conforming for a short distance in the NE¼ of Section 2, Township 48 North, Range 31 West, it deviates entirely and there is no further coincidence in the remainder of its extent.

The origin of this type of deposit and the cause for its coincidence with structure of the region presents a very difficult problem. Any theory advanced will be subject to criticism because of the lack of proof, but nevertheless the writer wishes to present the one which to him appears most logical. This theory involves a combination of regional uplift and differential compaction. It is logical to assume that Post-Pennsylvanian deformation in the Ozark region may have affected this area. Assuming that the shoe-string was deposited as an offshore bar on a comparatively flat ocean floor, a subsequent change in conditions of sedimentation might result in rapid deposition of mud, silt, and carbonaceous material, thus burying and preserving the bar. Then after deposition of some 1400 feet of Pennsylvanian sediments that probably overlaid it at one time, uplift in the Ozark region may reasonably have caused some warping in this area. Such warping together with the differential compaction in materials of the bar and of the surrounding sediments, might plausibly account for the type of structure represented here. Further evidence of the possible influence of warping is furnished by the fact that the bar area is bounded on the north and east by one of the two major synclines of the county indicating that there was structural deformation of considerable extent in this region.

The shoe-string has a total length of seven and one-

quarter miles but is divided by a small area about three-fourths of a mile wide which is devoid of sand. In all, 63 producing wells have been drilled on it and there are still two possible directions for its extension. One to the southeast in Section 6, Township 48 North, Range 31 West and the small stringer to the southwest in Section 21, Township 49 North, Range 32 West. The following figures are indicative of the prolific production of the shoe-string sand; the total initial open flow from 63 wells drilled to date is 89,766,960 cubic feet, an average of approximately 1,500,006 cubic feet per well. What the field may eventually produce is difficult to say. However, the well pressure or reservoir pressure has declined from a normal of between 145 and 150 pounds to between 70 and 90 pounds in the three and one-half months the field has been actively producing. Several wells are already showing water, indicating that depletion is progressing at a fairly rapid rate. This is to be expected because of close spacing of the wells and unrestricted production. The southeast extension will probably experience a longer life than the rest of the field due to a more systematic drilling program.

In addition to the areas already described there are several groups of wells scattered over the township that should be mentioned. In Section 1, Township 49 North, Range 32 West, are several small wells producing from the Wayside sand. They

have been used to supply a small number of houses in that area but are of no commercial value. Attempts to obtain production from deeper horizons in the area were unsuccessful. On the Raytown anticline (A) a number of small private wells have been in continuous use for ten years. The structure appears unusually favorable, yet several holes drilled near the crest were dry. Two other groups are very small and of little importance. They all have been abandoned and further development appears unlikely.

Future Development:

The future of this region is unusually promising. Continued development of the shoe-string sand of the Blue Ridge gas field appears likely and it is entirely possible that additional shoe-string sands may be discovered. Furthermore, the sharpness of the structure in this field makes it an excellent area for testing the other Pennsylvanian as well as pre-Pennsylvanian formations. The Rock creek nose is worthy of more careful investigation. It is possible the isolated well, Cavanaugh No. 1, NW¼ NE¼ SW¼, Section 9, Township 49 North, Range 32 West,(Map No. 67), producing from a sand at about the horizon of the so-called Bartlesville may be an indication of another gas field. The following table summarizes drilling in the region. However it does not include those wells in the Blue Ridge gas field which lie in Sections 1 and 2, Township 48 North, Range 32 West.

TABLE IX

	BLUE RIDGE GAS FIELD	REMAINDER OF REGION	TOTAL
Total Number of Wells of Which there is Record	126	119	245
Logs of Wells on File	126	94	220
Gas	76	52	128
Oil	0	0	0
Water	4	5	9
Dry holes	46	37	83

Township 50 North, Range 32 West

There is one small commercial pool in the area and several scattered wells. Several of the latter are deep holes bottomed in the Mississippian or lower formations.

The Independence pool in Sections 26 and 35, Township 50 North, Range 32 West has been previously described and a structure map of the area was published by Greene.[42] Since there have been no additional developments in the pool since that time, the lack of information regarding many of the wells and absence of any production statistics makes further description of the area unnecessary. The data available indicate that the lower sands, though penetrated, were non-productive or contained salt water.

In addition to this pool there are two other small gas wells in other parts of the area and several dry holes. One of the gas wells, Missouri Valley Gas and Oil Company, H. L. McElroy No. 1, (Map No. 23), SE¼ NW¼ SW¼, Section 28, Township 50 North, Range 32 West had sufficient gas to be saved for a commercial well. It was drilled on a supposedly well-defined surface structure and produced from the Squirrel sand, but two offset locations were dry holes so the structure

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42. Greene, F. C., Oil and gas pools of western Missouri: Missouri Bur. Geology and Mines, 57th Bienn. Rept., App. II, p. 39-41, 1933.

was abandoned and the lone well sold to the landowner. The other small gas well is on the Bessemer farm in SE¼, Section 23, Township 50 North, Range 32 West. It is producing from the horizon of the Warrensburg Channel sandstone.

Future Development:

The possibility of obtaining further production in this region is remote. Deeper drilling both in the Independence pool and in other parts of the area has failed to obtain any production from lower formations. The only chance lies in detailed mapping of this range with the possibility of discovering some new structural feature. However, the structure contour maps of this report lend little encouragement to such a project. The following table summarizes drilling in the region.

TABLE X

	INDEPENDENCE POOL	REMAINDER OF REGION	TOTAL
Total Number of Wells of Which there is Record	52	21	73
Logs of Wells on File	29	20	49
Gas	16	7	23
Oil	0	0	0
Water	0	3	3
Dry holes	13	10	23

Township 49 North, Range 33 West

This comprises the Kansas City townsite area with the exception of the southern part. In Kansas City there have been no commercial fields though there are a number of gas wells that have been used both for private and industrial use. This area has had more drilling with less success than any other portion of the county. This is attributed to the synclinal structure that embraces most of the area of Kansas City. The outcropping formations range from the Plattsburg limestone of the Lansing formation to the upper part of the Pleasanton and the producing horizons are similar to those found throughout the remainder of the county. The wells in this area are all abandoned or producing only very small amounts of gas. No producing wells have been drilled in Kansas City recently and the possibility of obtaining further production in the future appears remote.

Township 48 North, Range 33 West

This area is unimportant commercially except for the small Indian Creek pool in Section 28, Township 48 North, Range 33 West. The wells in this pool were all very small and lasted only a short time. The field lies at the junction of the valleys of Indian Creek and Big Blue River, hence drilling starts in beds stratigraphically below the Kansas City formation. For this reason the producing horizon is closer to the surface than in pools under the upland areas. Nine wells have been drilled here, four of which were dry holes. No information is available on the production and the field is completely abandoned.

There are a number of other wells scattered over the region and several have produced gas. However, none has been of commercial size and they have only been used privately. The future of the region is not very promising and careful detailed mapping should precede any further drilling.

The remainder of the county has only a few scattered wells. The majority of these lie to the northeast and east of the well-defined Kansas City-Blue Springs-Lone Jack syncline and with the exception of one or two that have small flows of gas, they are entirely non-productive. Most of the wells in this area were drilled primarily for water, consequently

drilling was stopped well above the producing horizons. The few that do go deep enough are poorly located structurally and are therefore dry holes. In spite of the results to date this region has considerable promise of production and recommendations concerning its future development will be made later in the report.

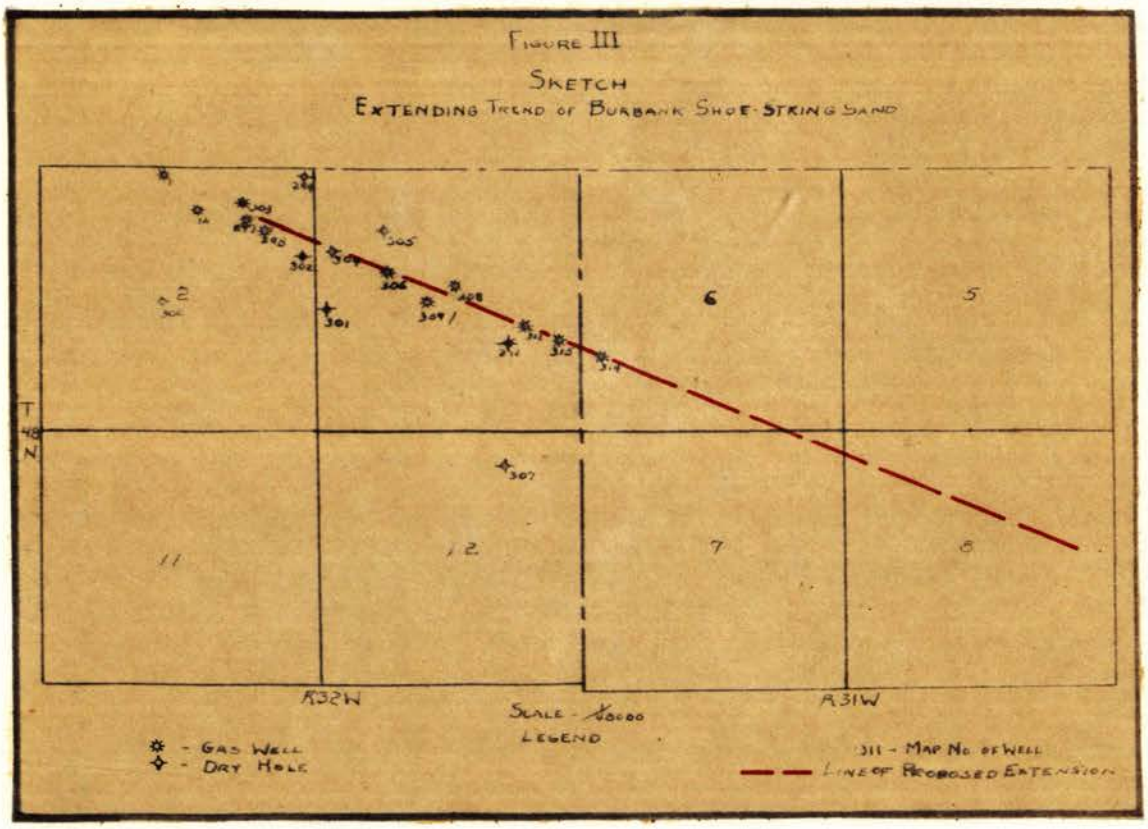
RECOMMENDATIONS

Since the purpose of this investigation was to determine the possibility of further development of oil and gas resources in Jackson County, the report would be incomplete without recommendations for future prospecting. Therefore, the following are suggested as locations that may be drilled with the minimum of preliminary work:

(1) Sections 19 and 20, Township 47 North, Range 32 West, in the East Grandview pool. Here the crest of the anticline has not been drilled for a distance of almost a mile. One well, Ruf Drilling Company, Sol Chiles No. 1, SW¼, Section 19, Township 47 North, Range 32 West, penetrated the Burgess sand but encountered salt water. However, this was west of the crest and the anticline is high enough structurally and has sufficient closure to make other locations more favorable. This structure also appears to be an excellent place for testing the pre-Pennsylvanian section.

(2) The SE¼ SW¼ NE¼, Section 9, Township 47 North, Range 30 West, within highest closed contour on the Adams Cemetery anticline. This area has seven wells producing from the Squirrel sand or higher but none have been used commercially. Any drilling in this area should be preceded by careful geologic work.

(3) Section 6, Township 48 North, Range 31 West, the extension of the shoe-string sand of the Blue Ridge gas field. The large scale maps (Plates III, IV and V) accompanying the report show a fairly definite trend to the southeast and in the following sketch this is projected a short distance beyond the present zone of production. In extending a shoe-string



sand it is well to remember that offshore bars and shoe-string sand bodies commonly have an offset arrangement and that there are gaps as in modern offshore bars. Since the evidence for offshore type of deposition is fairly conclusive for the sand body under discussion, the writer feels that the above precautionary statements are applicable to this region. In attempting further prospecting on the basis of the above sketch, the operators should bear in mind that it is more or less theoretical and may not be absolutely accurate. The fact that the shoestring does not coincide with the structure of the overlying beds in Section 1, Township 48 North, Range 32 West, indicates that detailed mapping of the area would be of little value in outlining the sand body.

The preceding recommendations cover those areas which may possibly become commercially productive. Other locations will probably become apparent to the reader on further study of the structure maps but they are small and are not worthy of recommendation for commercial development.

In addition to the above recommendations the writer believes that any part of the area northeast and east of the Kansas City-Blue Springs-Lone Jack syncline has definite possibilities and that detailed mapping of the entire region would be desirable. If this is not feasible the following specific locations should receive careful attention:

(1) The area in the vicinity of Haynes No. 1 well, (Map No. 1), NW¼ NW¼ NE¼, Section 16, Township 47 North, Range 29 West. Here the structure maps indicate a portion of a dome which lies along the eastern county line. The above well has the highest elevation on the base of the Lexington Coal Cap Rock in Jackson County. This is to be expected from its location in the southeast corner of the county, yet it is fully 50 feet higher than wells in the Lone Jack pool three and one-half miles southwest.

(2) The long westward plunging nose that extends through the north half of Township 49 North, Ranges 29, 30, 31, and 32 West.

(3) The area in the vicinity of the Erni well (Map No. 4), NW¼, Section 14, Township 50 North, Range 31 West. This isolated well is the northeasterly of the producing gas wells in Jackson County. It appears to be on the western edge of another westward plunging nose. Detailed mapping of this region will be difficult, due to the heavy covering of drift and loess in the upland areas.

CONCLUSION

In this report the writer has attempted to bring together all available information and thereby designate areas in which future development may be expected. In conclusion he wishes to point out that the accompanying structure maps, though compiled from all available information, are subject to change as more data becomes available. Particularly is this true where information is meager and contour lines consequently have been generalized. Therefore detailed mapping of any portion of the county if carefully done may encounter structural features not even indicated on these maps.

Finis

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APPENDIX I

Data Sheets

These data sheets list all wells used in preparing the structure maps of the County. The wells are listed by section, township, and range and are listed alphabetically in each section. In addition the data sheets are arranged by township and range beginning in the SE part of the County.

8 Jackson County

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
			T.47-R.29							
1	Lone Jack O. & G. Co.	W. L. Haynes #1	16-47-29	1050	484	0 -	1050 -	245	805	Dry hole
2	" " " " "	W. L. Haynes #2	16-47-29	1022	330			225	797	Dry hole
3	Lone Jack O. & G. Co.	Parrish	16-47-29	1049	400			256	793	Dry hole
6	" " " " " "	(Wetzell) Tony Jelnick	18-47-29	1014	425	31	983	300	714	Dry hole
7	Lone Jack O. & G. Co.	Leach #1	19-47-29	1018	255	21	997			Gas
8	Lone Jack O. & G. Co.	Leach # 2	19-47-29	1014	351	25	989	273	741	Dry hole
9	Lone Jack O. & G. Co.	Leach # 3	19-47-29	1036	409	39	997	290	746	Gas
10	Lone Jack O. & G. Co.	Leach # 4	19-47-29	1037	418	36	1001	282	755	Gas
11	Lone Jack O. & G. Co.	Leach # 5	19-47-29	1023	350	31	992	280	743	Aband. Gas
12	Lone Jack O. & G. Co.	Mark E. Robinson	19-47-29	1039	403	38	1001	291	748	Gas
13	" " " " "	Malkaw # 3	20-47-29	1023	505	30	993	287	736	Water
14	" " " "	W. L. Ragsdale#1	20-47-29	1040	427	33	1007	296	744	Dry hole
15	" " "	W. L. Ragsdale#2	21-47-29	972	340			227	745	Water
16	Lone Jack O. & G. Co.	Leach # 6	30-47-29	1029	365	38	991	291	738	Dry hole
A	" " " "	" " " "	T.47-R.30							
1	Lone Jack O. & G. Co.	Adams & Witte#1	3-47-30	1023	450	30	993	282	741	Gas

A

Addenda

T. 47 - R. 29

Map No. of Loc..	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B. F.	Elev. Tpp B. F.	Depth Base My. Sta.	Elev. Base My. Sta.	Type of Well
17		Old Moore	28/47/29	982	290	12	970	266	716	Water
18	Kansas City LifeInsCo.	Keller	30/47/29	969	435	29	940	313	656	Water

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Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
2	Lone Jack O. & G. Co.	Jackson # 1	3-47-30	1020	570	22	998	275	745	Gas
3		W. S. Easlly #1	8-47-30	1010	480	28	982	273	437	Dry
4		W. S. Easlly #2	8-47-30	998	360	26	972	276	722	Dry
5	Lone Jack O. & G. Co.	Fehrman # 1	8-47-30	1035	360	32	1003	281	754	Gas
6		Frank Norton # 1	9-47-30	1012	260			253	759	Gas
7	Lone Jack O. & G. Co.	David Adams # 1	10-47-30	1036	505	30	1006	281	755	Gas
8	Lone Jack O. & G. Co.	Robert Adams # 1	10-47-30	1023	400	21	1002	277	746	Gas
9	Lone Jack O. & G. Co.	Steve Haller #1	13-47-30	1009	370	10	999	262	747	Gas
10	Lone Jack O. & G. Co.	Steve Haller #2	13-47-30	989	357½			261	728	Gas
11		Neinenger # 2	13-47-30	993	415			287	706	Dry
12	Lone Jack O. & G. Co.	J.D. Shawhan #1	13-47-30	967	370			241	726	Aband. Gas
13	Lone Jack O. & G. Co.	J.D. Shawhan #4	13-47-30	957	355			242	715	Aband. Gas
14	Lone Jack O. & G. Co.	J.D. Shawhan #5	13-47-30	1011	425	49	962	292	719	Dry
15		S. C. Shore	13-47-30	1004	405	55	949	299	705	Gas
16		Jas. Noel	14-47-30	1004	410	32	972	298	706	Dry
17	Lone Jack O. & G. Co.	J. Shawhan #2	14-47-30	1017	412	47	970	309	708	Gas
18	Lone Jack O. & G. Co.	J. Shawhan # 3	14-47-30	1009	390	33	976	294	715	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
19	Lone Jack O. & G. Co.	J. Shawhan #6	14-47-30	1023	405	41	982	287	736	Gas
20	Lone Jack O. & G. Co.	Lee Shawhan # 3	14-47-30	1015	390	18	997	287	728	Gas
21	Lone Jack O. & G. Co.	Lee Shawhan # 4	14-47-30	991	365	3	988	267	724	Gas
22	Lone Jack O. & G. Co.	Lee Shawhan #5	14-47-30	1017	411	34	983	294	723	Aband. Gas
23	Lone Jack O. & G. Co.	Lee Shawhan #6	14-47-30	1028		50	978	309	719	Gas
24	Lone Jack O. & G. Co.	Lee Shawhan # 7	14-47-30	1027	418	46	981	309	718	Gas
25	Lone Jack O. & G. Co.	Lee Shawhan # 8	14-47-30	1025	422	58	967	321	704	Dry
26	R. O. Wright	Stat. Rightway Filling	17-47-30	1031	273	28	1003	277	754 E	Gas
27	Lone Jack O. & G. Co.	Fehrman # 2	18-47-30	1031	334	58	973	314	717	Aband. Gas
28		(Howard Ridgeway) Malkow #1	23-47-30	984	435	39	945	297	687	Water
29		Malkow #2	23-47-30	929	420			254	675	Water
30	Lone Jack O. & G. Co.	D.Lee Shawhan #1	23-47-30	1029	712	32	997	304	725	Aband. Gas
31	Lone Jack O. & G. Co.	D.Lee Shawhan #2	23-47-30	1023	404	30	993	303	720	Aband. Gas
32	Lone Jack O. & G. Co.	Geo. Shawhan #1	23-47-30	1012	485	38	974	316	710	Dry
33	Lone Jack O. & G. Co.	Geo. Shawhan #2	23-47-30	990	435	30	960	294	696	Dry
34	Lone Jack O. & G. Co.	Ball #1	24-47-30	1028	412	35	993	304	724	Gas
35	Lone Jack O. & G. Co.	Frank Cave #1	24-47-30	1005	421	26	979	293	712	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
36	Lone Jack O. & G. Co.	H. Cave # 1	24-47-30	1021	409	40	981	305	716	Gas
37		W. H. Davidson #1	24-47-30	1025	420	35	990	303	722	Gas
38	Lone Jack O. & G. Co.	Faulkenberry	24-47-30	1011	430	37	974	308	703	Dry
39	Lone Jack O. & G. Co.	Steve Haller #3	24-47-30	1032	394	30	1002	304	728	Gas
40	Lone Jack O. & G. Co.	Steve Haller #4	24-47-30	1020	387	25	995	285	728	Gas
41	Lone Jack O. & G. Co.	Hopkins #1	24-47-30	1019	415	16	1003	306	713	Gas
42	Lone Jack O. & G. Co.	Neinenger # 1	24-47-30	1001	409	40	961	305	696	Dry
43		#3	24-47-30	1019	410	47	972	318	701	Gas
44	Leo. George	Lee Shawhan #1	24-47-30	993	430	20	973	289	704	Water
45	Lone Jack O. & G. Co.	Slater # 1	24-47-30	984	406			275	709	Aband. Gas
46	Lone Jack O. & G. Co.	M. Stafford #1	24-47-30	997	383½	18	979	285	712	Gas
48	Lone Jack O. & G. Co.	Ben Yankee #1	24-47-30	1030	411	34	996	306	724	Gas
49	Lone Jack O. & G. Co.	John Robinson #1	25-47-30	1038	434	50	988	323	715	Aband. Gas
50	Lone Jack O. & G. Co.	John Robinson #2	25-47-30	1029	410	30	999	302	727	Gas
51		Chas. A. Johnson	28-47-30	1003	411	25	978	281	722	Dry
52		#2 Chas. W.Johnson	28-47-30	982	350	4	978	260	722	Dry
53		#3 Chas. W.Johnson	28-47-30	987	330	16	971	267	720	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
54	Lone Jack O. & G. Co.	J. Clark # 1	29-47-30	1011	410	36	975	309	702	Dry
55	Lone Jack O. & G. Co.	J. Clark #2	29-47-30	1034	404	66	968	310	724	Gas
56		Chas. W. Johnson #4	29-47-30	998	440	31	967	280	718	Dry
57	Lone Jack O. & G. Co.	John Johsnon#1	29-47-30	1029	394	56	973	314	723	Dry
58	Lone Jack O. & G. Co.	John Johnson #2	29-47-30	1029	385	57	972	305	724	Gas
59	Lone Jack O. & G. Co.	Geo. Kennedy #1	29-47-30	1029	425	60	969	308	721	Dry
60	Lone Jack O. & G. Co.	Geo. W. Martin	30-47-30	1019	530	49	970	321	698	Water
62	Lone Jack O. & G. Co.	James McKittrick	30-47-30	1001	385	37	964	284	717	Dry
63	Lone Jack O. & G. Co.	John McKittrick#1	30-47-30	1008	379	36	972	282	726	Gas
64	Lone Jack O. & G. Co.	John McKittrick#2	30-47-30	1010	361	43	967	291	719	Gas
66		Clark Knorpp	31-47-30	997	390	28	969	281	716	Dry
68		J. E. Spencer #1	31-47-30	981	365			254	727	Aband. Gas
69		J. E. Spencer #8	31-47-30	1009	555	26	983	291	718	Water
70	Lone Jack O. & G. Co.	Luther W. Bagner #1	32-47-30	1032	372	36	996	287	745	Gas
71	Lone Jack O. & G. Co.	Luther W. Bagner #2	32-47-30	1030	378	30	1000	285	745	Gas
72	Lone Jack O. & G. Co.	Luther W. Bagner #3	32-47-30	1015	362	17	998	271	744	Gas
73	Lone Jack O. & G. Co.	Luther W. Bagner #4	32-47-30	1014	294	10	1004	265 E	749 E	Oil

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
74	Lone Jack O. & G. Co.	#5 Luther W. Bagner	32-47-30	1008	330	11	997	266	742	Gas
75	Lone Jack O. & G. Co.	#6 Luther W. Bagner	32-47-30	1003	290	10	993	260 E	743 E	Oil
76	Lone Jck. O. & G. Co.	#7 Luther W. Bagner	32-47-30	990	349			255	735	Gas
77	Lone Jack O. & G. Co.	#8 Luther W. Bagner	32-47-30	999	360			256	743	Gas
78	Lone Jack O. & G. Co.	#9 Luther W. Bagner	32-47-30	1006	275	14	992			Oil
79	Lone Jack O. & G. Co.	#10 Luther W. Bagner	32-47-30	1010	276	10	1000	265	745	Oil
80	Lone Jack O. & G. Co.	Ott Clark # 1	32-47-30	1046	408	72	974	322 E	724 E	Gas
81	Lone Jack O. & G. Co.	Ott Clark # 2	32-47-30	1037	402	69	968	312	725	Gas
82	Lone Jack O. & G. Co.	Ott Clark # 3	32-47-30	1010	366	29	981	288	722	Gas
83	Lone Jack O. & G. Co.	Ott Clark # 4	32-47-30	1031	374	35	996	286	745	Gas
84	Lone Jack O. & G. Co.	Ott Clark # 5	32-47-30	1036	400	47	989	295	741	Dry
85	Lone Jack O. & G. Co.	Ott Clark # 6	32-47-30	1020	375	19	1001	272	748	Gas
86	Lone Jack O. & G. Co.	Ott Clark # 7	32-47-30	1006	675	14	992	269	737	Gas
87	Lone Jack O. & G. Co.	Ott Clark # 8	32-47-30	1018	380	32	986	288	730	Gas
88	Lone Jack O. & G. Co.	Ott Clark # 9	32-47-30	1020	380	28	992	289	731	Gas
89	Clark Knorpp Co.	Harry Knorpp #1	32-47-30	1036	365	27	1009	277	759	Gas
90	Clark Knorpp Co.	Harry Knorpp #2	32-47-30	1040	385	49	991	293	747	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
91	Clark Knorpp Co.	Harry Knorpp #3	32-47-30	1023	367½	26	997	272	751	Gas
92	Clark Knorrp Co.	Harry Knorpp #4	32-47-30	1038	397½	62	976	303	735	Gas
93	Lone Jack O. & G. Co.	Shires #1	32-47-30	1015	420	45	970	304	711	Dry
94	Lone Jack O. & G. Co.	Shires # 2	32-47-30	1027	412	55	972	292	735	Dry
95	Lone Jack O. & G. Co.	Dan Busch #1	33-47-30	1019	378½	21	998	280	739	Aband. Gas
96	Lone Jack O. & G. Co.	Dan Busch #2	Could not find		380					Dry
97	Lone Jack O. & G. Co.	James R. Knorpp#1	33-47-30	1031	386½	30	1001	267 E	764 E	Gas
98	Lone Jack O. & G. Co.	Knorpp #2	33-47-30	1025	373	27	998	264 E	761 E	Gas
99	Lone Jack O. & G. Co.	Knorpp #3	33-47-30	1039	375	27	1012	279	760	Gas
100	Lone Jack O. & G. Co.	Knorpp #4	33-47-30	1030	360	21	1009	272	758	Gas
101	Lone Jack O. & G. Co.	Knorpp #5	33-47-30	1044	416	78	966	332	712	Dry
102	Lone Jack O. & G. Co.	Knorpp #6	33-47-30	1039	388	38	1001	289	750	Gas
103	Lone Jack O. & G. Co.	James R.Knorpp#7	33-47-30	1033	381	31	1002	283	750	Gas
104	Lone Jack O. & G. Co.	Knorpp #8	33-47-30	1031	367	22	1009	277	754	Gas
105	Lone Jack O. & G. Co.	Knorpp #9	33-47-30	1021	311	26	995	265 E	756 E	Oil
106	Lone Jack O. & G. Co.	Knorpp #10	33-47-30	1010	283	8	1002	255 E	755 E	Oil
107	Lone Jack O. & G. Co.	Knorpp #11	33-47-30	982	335			226 E	756 E	Gas

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Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
108	Lone Jack O. & G. Co.	Knorpp #12	33-47-30	990	353			245 E	745 E	Gas
109	Lone Jack O. & G. Co.	Knorpp #13	33-47-30	1000	350	7	993	254	746	Gas
110	Lone Jack O. & G. Co.	Knorrp #14	33-47-30	1026	296	14	1012	270 E	756 E	Oil
111	Lone Jank O. & G. Co.	Knorpp #15	33-47-30	1002	315	30	972	266	746 E	Oil
114	Lone Jack O. & G. Co.	Knorpp #19	33-47-30	1007	334			251	756	Gas
115	Lone Jack O. & G. Co.	Knorpp #20	33-47-30	1033	430	41	992	292	741	Dry
116	Lone Jack O. & G. Co.	F.S. Storms #1	33-47-30	1034	400	42	992	294	740	Aband Gas
117	Lone Jack O. & G. Co.	F. S. Storms #2	33-47-30	1035	388½	29	1006	284 E	751 E	Gas
118	Lone Jack O. & G. Co.	F. S. Storms #3	33-47-30	1025	380	21	1004	277 E	748 E	Gas
119	Lone Jack O. & G. Co.	F. S. Storms #4	33-47-30	1021	363	15	1006	268 E	753 E	Gas
120	Lone Jack O. & G. Co.	F. S. Storms #5	33-47-30	1011	339			257	754	Gas
121	Lone Jack O. & G. Co.	J. A. Thornton #1	33-47-30	1014	38	17	997	283 E	731 E	Dry
122	Lone Jack O. & G. Co.	J. A. Thornton #1	33-47-30	1027	375	18	1009	279	748	Gas
123	Lone Jack O. & G. Co.	Arch Hepsher	34-47-30	935	301			205	730	Dry
B-										

4/2

Addenda
T. 47 - R. 30

Map No. of Wc..	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B. F.	Elev. Tpp B. F.	Depth Base My. Sta.	Elev. Base My. Sta.	Type of Well
124		Peringer	1-47-30	920	225			206	714	Water
125		Charlton	3-47-30	987	400	15	972	270	717	Water
126	Goodwill Community Center	Camp	7-47-30	994		37	957	---	705 E	Water
137		Trelee	8-47-30	979	92	40	939		692 E	Water
128		F. R. Noel	15-47-30	1004	135	---	829 E	---	577 E	Water
129		Harvey Brock	16-47-30	1014	172	126	888	---	636 E	Water
130		Bruce Dodson#1	17-47-30	1003	56	16	987	---	735 E	Water
131		#2		1003	500	16	987		731	Dry
132		H. Hartz	17-47-30	1065	128	121	944		692 E	Water
133		F. L. Dawson	20-47-30	1035	240	151	884		632 E	Water
134		J. W. Wheat	20-47-30	1022	140	95	927		675 E	Water
136		George Dillon	22-47-30	960	412	70	890	316	644	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
			T.47-R.31							
1		Wm. Howard	1-47-31	1007	265	87	920			Gas
2		Milton Thompson	1-47-31	1018	225	81	937			Gas
3		H. Hoke #1	2-47-31	991	247	71	920			Dry
4		H. Hoke #2	2-47-31	993	432	68	925	316	677	Dry
5		Aldridge #1	5-47-31	1028	326	110	918			Gas
6		C. J. Banker	5-47-31	1003	426	78	925	330	673	Gas
7		F. Blackwell	5-47-31	1030	317	125	905			Dry
8		T. C. Blackwell#1	5-47-31	1014	426	96	918	351	663	Dry
9		T. C. Blackwell#2	5-47-31	1005	283	89	915			Dry
10		T. C.Blackwell #3	5-47-31	1016	267	77	939			Gas
12		Carr #1	5-47-31	1022	290	107	915			Gas
13		Carson #1	5-47-31	998	248	65	933			Gas
14		Bert Clark #2	5-47-31	1023	307	99	924			Gas
15		Collins	5-47-31	1024	282	105	919			Gas
16		Corder #1	5-47-31	1039	342	135	904			Gas
17		" #2	5-47-31	1034	332	124	910			Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
19	Nath Corder, et al	Everton	5-47-31	990	260	55	935			Dry
20	" " "	Fesher #1	5-47-31	978	306	44	934	306	672	Gas
21	" " "	Fisher #2	5-47-31	995	261	63	932			Gas
22	" " "	Fisher #3	5-47-31	987	252	55	932			Gas
24	C. E. Phillips	Graffice #1	5-47-31	991	254	60	931			Gas
25	" "	" ##2	5-47-31	1016	287	87	929			Gas
26		Dr. Hand #1	5-47-31	1032	310	103	929			Dry
29	Rush, Arnold, et al	Hoover #1	5-47-31	1027	320	108	919			Oil
30	Less Summit Gas Co.	Henry Long #2	5-47-31	1015	305	90	925			Gas
31		Maxwell #1	5-47-31	1025	290	80	945			Gas
32		McKesson & Roos #1	5-47-31	1028	283	108	920			Gas
33		McKinley #1	5-47-31	996	245	65	931			Dry
34	Spicer Campbell, Thompson,	Campbell Morning Side Acres #1	5-47-31	1023	300	110	913			Oil
35	" "	" #2	5-47-31	1026	325	111	915			Oil
36	M. J. White	Muckie	5-47-31	959	360	37	922	300	659	Dry
38		Schick #1	5-47-31	1053	302	112	941			Oil
40	Thomas, et al	Wm. Short	5-47-31	989	415	60	929	317	672	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
41		Turoff Mtr. Co.	5-47-31	1033	284	104	929			Gas
42	Mort White	City #1	5-47-31	1012	261	100	912			Dry
43	" " " "	Mont Williams	5-47-31	1019	284	94	925			Gas
47		Acuff Chev. Co.	6-47-31	1052	311	119	933			Gas
48		W. L. Baker	6-47-31	1031	281	90	941			Gas
49		Frank Bales #1	6-47-31	1023	279	79	944			Gas
50		" " #2	6-47-31	1013	271	71	942			Gas
51		Browning	6-47-31	1036	297	79	957			Gas
52		Browning & Miller	6-47-31	1030	287	92	938			Gas
53		Butterfield	6-47-31	1003	265	59	944			Dry
54		Dr. Campbell	6-47-31	1023	284	92	931			Gas
56	M. J. White	Joe Cox	6-47-31	1045	305	101	944			Gas
57	" "	Davis	6-47-31	1028	289	93	935			Gas
58	" " " "	Day #1	6-47-31	993	279	64	929			Oil
59	" " " "	Day #2	6-47-31	993	270	49	944			Oil
60	Mid-Continent Petroleum	Diamond Station	6-47-31	1052	320	114	938			Gas
61		Diehl #1	6-47-31	991	275	71	920			Oil

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
66	M. J. White	Dickerson	6-47-31	1032	672			334	698	Gas
68	M. M. White	Price Gunn	6-47-31	1032	293	93	939			Gas
69	M. J. White	Higgins	6-47-31	1016	280	70	946			Gas
70		Lee	6-47-31	1042	630	106	936	363	679	Dry
71		Marie McCarthy	6-47-31	1024	285	75	949			Gas
79		Wallace	6-47-31	1053	317	112	941			Gas
80		Wantraub, Meyers & Palmer	6-47-31	1032	286	96	936			Gas
81		Weintroub House well	6-47-31	1031	287	93	938			Gas
82		Wilson	6-47-31	1013	294	73	940			Dry
83		Worthington	6-47-31	1030	272	92	938			Gas
84		Young	6-47-31	996	445	55	941	318	678	Dry
85		Bayless	7-47-31	1044	310	107	937			Gas
86		Kenton	7-47-31	1015	729	71	944	330	685	Dry
87		Geo. Lawrence	7-47-31	1020	275	73	947			Gas
88		Matheney	7-47-31	1047	412	100	947			Oil
89		Palmer	7-47-31	1035	287	73	962			Gas
90	Dr. Campbell	Howard #1	8-47-31	1030	355	149	881			Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
91		Joe Lentz	8-47-31	1000	345	93	907			Dry
92		Thomason	8-47-31	1032	511	98	934	351	681	Dry
93	Ruf Drilling Co.	Bell	10-47-31	1035	420	70	965	342	693	Dry
94		H. Necessary	10-47-31	1021	312	79	942			Dry
95		Robt. Williams	17-47-31	990	688	83	907	338	652	Dry
96		John Harris	21-47-31	953	625	36	917	284	669	Dry
97	Prudential Life Ins.	Farm	22-47-31	1033	730	107	926	366	667	Water
98	J. D. Judd & Co.	E. R. Harbison	25-47-31	983	600	47	936	299	684	Dry
99		Phil K. Toll (Deep test)	27-47-31	967	2550	63	904	303	663	Dry

Addenda
T. 47 - R. 31

Map No. of Loc..	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B. F.	Elev. Top B. F.	Depth Base My. Sta.	Elev. Base My. Sta.	Type of Well
100		Harry Hartz #1	9-47-31	1006	120	46	960	---	709 E	Water
101		" " #2	9-47-31	1019	330	54	965	---	714 E	Gas
104		" " #3	12-47-31	1027	100	49	978	---	727 E	Dry
105		" " #4	12-47-31	1023	210	70	953	---	702 E	Dry
106		" " #5	12-47-31	1003	268	66	937	---	686 E	Dry
102		Smith	13-47-31	1034	160	73½	960		709 E	Water
103		R. J. Stuart	20-47-31	1055	475	142	913	386	669	Dry

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Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
			T.47-R.32							
1		Sam Edmondson #1	1-47-32	1014	373	105	909	356	658	Dry
2		Sam Edmondson #2	1-47-32	1013	387	112	901	369	644	Dry
3	Jeffers & Newberg	E. E. Hake #1	1-47-32	971	242	26	945	283 E	688 E	Dry
4	Jeffers & Newberg	E. E. Hake #2	1-47-32	962	245	22	940	279 E	683 E	Dry
5	Jeffers & Newberg	E. E. Hake #4	1-47-32	944	345	15	929	272	672	Dry
6		McMurray	1-47-32	989	319	75	914	332 E	657 E	Gas
7		Seth Ward	1-47-32	996	400	59	937	320	676	Dry
9		W. L. Moberly	2-47-32	950	300	22	928	279 E	671 E	Gas
10	M. T. Drilling Co.	J.W. & J.P. Olson #1	3-47-32	933	360	36	897	282	651	Dry
11	M. T. Drilling Co.	J.W. & J.P. Olson #2	3-47-32		525	5	895	258	642	Dry
12		C. S. Foreman Highland Grove#1	4-47-32	983	640	90	893	347	636	Dry
13		C. S. Foreman Highland Grove#2	4-47-32	950 ±	110	55	895 ±			Water
14		C. S. Foreman Highland Grove#3	4-47-32	948	101	55	893			Water
15		J. A. Ervin	5-47-32	954	461	105	849	370	584	Dry
16		John Kling #1	5-47-32	904	380	45	859	300	604	Water
17		John Kling #2	5-47-38	917	210	52	865			Water

(A-5)

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
18		John Kling #3	5-47-32	928	565	59	869	321	607	Dry
20		Joe Pierce	7-47-32	1059	751	215	844	477 E	582 E	Dry
21	M. T. Drilling Co.	Scrivner	7-47-32	935	359	99	836	355	580	Dry
22		Harline	12-47-32	957	547	45	912	305	652	Dry
24	J. D. Judd & Co.	Longview Farm	16-47-32	975	627	125	850	385	590	Dry
29		Chrisman #1	17-47-32	952	366	83	869	344	608	Gas
30		Chrisman #2	17-47-32	897	510	32	865	293	604	Gas
31		McMahon	17-47-32	1015	662	152	863	411	604	Dry
32	J. D. Judd	Thompson #1	17-47-32	961	605	96	865	355	606	Gas
33	J. D. Judd	Thompson #2	17-47-32	962	373	97	865	355	607	Gas
34	J. D. Judd	Thompson #3	17-47-32	889	490	32	857	290	599	Gas
35	J.D. Judd, M.T. Drilling Co.	" #4	17-47-32	872	520	22	850	279	593	Dry
36	" "	Wallace #1	17-47-32	1006	621	138	868	394	612	Dry
37	" "	Wallace #2	17-47-32	1060	675	200	860	455	605	Dry
38	" "	Wallace #3	17-47-32	937	537	65	872	323	615	Gas
39		Kurgwell #1	18-47-32	928	305	56 E	872 E	322 E	606 E	Dry
40		Kurgwell #2	18-47-32	942	322	72	870	338 E	604 E	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
41		Kurgwell #3	18-47-32	961	455	83	878	350	611	Dry
42		Kurgwell #4	18-47-32	918	551	50	868	306	602	Dry
43		Kurgwell #5	18-47-32	929	306	60	869	326 E	603 E	Dry
44	Louis Knoche	Ada E. Saleela#2	18-47-32	962	360½	97	865	356	606	Gas
45	Louis Knoche	" #3	18-47-32	949	339	73	876	334	615	Gas
46	Louis Knoche	Chiles #1	18-47-32	928	300	37	891	295	633	Aband. Gas
47	Louis Knoche	Chiles #2	19-47-32	930	572	52	878	306½	623½	Dry
48	Ruf Drilling Co.	Sol Chiles #1	19-47-32	921	665	42	879	297	624	Dry
49	Louis Knoche	H. J. Elliott	19-47-32	962	354	89	873	349	613	Gas
50	LouisKnoche	H. J. Elliott	19-47-32	958	348½	88	870	343	615	Gas
52	M. T. Drilling Co.	McLucas #1	20-47-32	1053	670	191	862	450	603	Gas
53	M. T. Drilling Co.	McLucas #2	Could not find		650					Dry
54	M. T. Drilling Co.	McLucas #3	Could not fine		660					Dry
55	Lees Summit Gas Co.	Hook #1	23-47-32	976	511	87	889	344	632	Dry
56	Lees Summit Gas Co.	Hook #2	26-47-32	1010	614	129	881	387	623	Dry
57		C. L. Peterson #1	28-47-32	940	423	106	834	358	582	Dry
59		C. L. Peterson #3	28-47-32	1001	515	141	860	394	607	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
60		C. L. Peterson #4	28-47-32	963	278	83	880	336	627	Dry
61	Louis Knoche	Orear #4	30-47-32	1013	381½	140	873	395 E	618	Dry
63		Russell	31-47-32	974	340	136	838			

Addenda
T. 47 - R. 32

Map No. of Loc..	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B. F.	Elev. Top B. F.	Depth Base My. Sta.	Elev. Base My. Sta.	Type of Well
64	Kling-Judd Oil Co.	John Kling #1	5-47-32	925	426	58	863	315	610	Dry
65	" " " "	" " #2	5-47-32	921	440	58	867	317	604	Dry
66	" " " "	" " #3	5-47-32	928	452	64	864	333	595	Dry
67	" " " "	" " #4	5-47-32	823	490	---	---	200	623	Dry
68	" " " "	" " #5	5-47-32	910	555	33	877	291	619	Dry
69	" " " "	" " #6	5-47-32	924	436	59	865	318	606	Dry
70	" " " "	" " #7	5-47-32	911	425	50	861	310	601	Dry
71	Kling-Judd Oil Co.	John Kling #8	5-47-32	928	438	62	866	321	607	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
			T.47 - R.33							
1	Bartle & Marshall	E. Holmes #1	3-47-33	911	440	90	821	353	558	Dry
2	Bartle & Marshall	Swafford #1	3-47-33	970	380	136	834			Dry
3	Bartle & Marshall	Swafford #4	3-47-33	980	510	158	822	430	550	Gas
4		Dr. W.E. Minor#1	4-47-33	846	566	2	844	266	580	Gas
5		Dr. W.E. Minor#3	4-47-33	841	575	5	836	867	574	Gas
6		Dr. W.E. Minor#7	4-47-33	841	580	3	858	268 E	573 E	Dry
7		Dr. W.E. Minor#8	4-47-33	823	605			270	553	Dry
11	Bartle & Marshall	Reid #1	4-47-33	911	635	70	841	338	573	Dry
12	Bryce B. Smith	Red Bridge #1	4-47-33	839	302			268	571	Gas
13		#2	4-47-33	829	502			257	572	Gas
14		#3	4-47-33	811	455			246	565	Dry
15	J. M. Horner	Holmes #1	5-47-33	874	610	47	827	316	558	Dry
16		J. B. Howe #1	5-47-33	854	361	28 or 49	826 805	291	563	Gas
17	J. D. Judd	Lester #18	5-47-33	963	490	154	809	422	541	Gas
18	J. D. Judd	Lester #19	5-47-33	957	475	142	815	405	552	Gas
19		Dr. W.E. Minor#6	5-47-33	871	591	59	812	303	568	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
20		Dr. L. L. Potts	5-47-33	933	165	121	812			Water
22	Dallas Oil & Gas Co.	Lester #0	6-47-33	953	657	137	816	394	559	Oil
23	Dallas Oil & Gas Co.	#1	6-47-33	940	491	122	818	386	554	Oil
24	Dallas Oil & Gas Co.	#2	6-47-33	940	490	119	82	382	558	Oil
25	Dallas Oil & Gas Co.	#3	6-47-33	945	520	134	811	408	547	Oil
26	Dallas Oil & Gas Co.	#4	6-47-33	925	494	112	813	382	543	Oil
27	Dallas Oil & Gas Co.	#5	6-47-33	935	515	127	808	397	538	Oil
28	Dallas Oil & Gas Co.	#6	6-47-33	936	475	116	820	380	556	Oil
29	Dallas Oil & Gas Co.	#7	6-47-33	929	450	114	815	377	552	Oil
30	Dallas Oil & Gas Co.	#8	6-47-33	918	483	107	811	375	543	Oil
31	Dallas Oil & Gas Co.	#8A	6-47-33	920	509	109	811	368	560	Dry
32	Dallas Oil & Gas Co.	#8B	6-47-33	947	485	126	821	388	559	Dry
33	Dallas Oil & Gas Co.	#9	6-47-33	921	505	115	806	385	536	Oil
34	Dallas Oil & Gas Co.	#10	6-47-33	900	475	95	805	366	534	Oil
35	Dallas Oil Co.	#11	6-47-33	932	505	125	807	394	538	Oil
36	Dallas Oil Co.	#12	6-47-33	913	480	104	809	367	546	Dry
37	Dallas Oil & Gas Co.	LESTER #13	6-47-33	897	456	88	809	358	539	Oil

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
38	Dallas Oil & Gas Co.	Lester #14	6-47-33	913	470	98	815	361	552	Dry
39	Dallas Oil & Gas Co.	#15	6-47-33	903	464	92	811	361	542	Oil
40	Dallas Oil & Gas Co.	#16	6-47-33	921	421	105	816	370	551	Oil
41	Dallas Oil & Gas Co.	#17	6-47-33	961	530	150	811	419	542	Oil
43	Dallas Oil & Gas Co.	#20	6-47-33	940	515	134	806	395	545	Dry
44		James G. Gale #1	7-47-33	954	551	131	823	398	556	Dry
45		James G. Gale #2	7-47-33	907	413	81	826	346	564	Gas
46		James G. Gale #3	7-47-33	880	430	64	816	331	549	Dry
47		James G. Gale #4	7-47-33	947	625	120	827	385	562	Dry
48		James G. Gale #5	7-47-33	877	440	57	820	320	557	Gas
49		James G. Gale	7-47-33	874	630	59	815	330	544	Dry
53	M. T. Drilling Co.	Klapmeyer #1	7-47-33	957	530	142	815	399	558	Oil
54	M. T. Drilling Co.	" #2	7-47-33	949	519	136	813	400	549	Oil
55	M. T. Drilling Co.	" #3	7-47-33	947	511	141	806	406	541	Oil
56	M. T. Drilling Co.	" #4	7-47-33	955	524	141	814	403	552	Oil
57	M. T. Drilling Co.	" #4A	7-47-33	940	525	139	801	412	528	Dry
58	M. T. Drilling Co.	" #5	7-47-33	954	530	149	805	420	534	Oil

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
59	M. T. Drilling Co.	Klapmeyer #6	7-47-33	954	528	146	808	411	543	Oil
60	Dallas Oil Co.	" #7	7-47-33	963	535	145	818	403	560	Oil
61	Dallas Oil Co.	" #7A	7-47-33	945	530	136	809	408	537	Dry
62		H. E. Chick #1	8-47-33	915	583	80	835	347	568	Gas
63		H. E. Chick #2	8-47-33	942	618	112	830	378	564	Dry
68	J. D. Judd & Co.	Van Gunton #1	8-47-33	856	517	17	839	276	580	Gas (G.S.)
69	J. D. Judd & Co.	Van Gunton #2	8-47-33	838	508	3	835	265	573	Gas
70	Judd Drilling Co.	B. J. Kerr #1	8-47-33	898	550	65	833	328	570	Gas
71	Judd Drilling Co.	B. J. Kerr #2	8-47-33	886	553	49	837	317	569	Gas
72	Judd Drilling Co.	B. J. Kerr #3	8-47-33	875	362	37	838	313	562	Gas
73	J. D. Judd	Klapmeyer #6	8-47-33	825	361			251	574	Dry
74	J. D. Judd	Klapmeyer #9	8-47-33	890	542			309	581	Dry
75	J. D. Judd	Klapmeyer #10	8-47-33	824	440			286	538	Gas
76	J. D. Judd	Klapmeyer #11	8-47-33	879						Dry
77	J. D. Judd	Klapmeyer #19A	8-47-33	827	360			276	551	Oil
78	J. D. Judd	Kate Mosher #2	8-47-33	906	575			335	571	Dry
79		Schaeffer	8-47-33	852	535			303	549	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
80		Spruäll #1	8-47-33	886	541	60	826	324	562	Gas
81		Spruill #2	8-47-33	879	547	66	813	310	569	Gas
84		Bays Hotel Camp#1	9-47-33	866	607			289	577	Gas
85		" " " #2	9-47-33	954	643	112	842	377	577	Dry
86	Lewis Newberg, et al	A. G. Higgins #1	9-47-33	813	231			228	585	Oil
87	" " " "	" " #2	9-47-33	810	316½			232	578	Oil
88	" " " "	" " #3	9-47-33	810	316			237	573	Oil
89	" " " "	" " #4	9-47-33	813	325			231	582	Oil
90	L. Newberg, et al	Holmes #1	9-47-33	853	620			264	589	Gas
91		Holmes #2	9-47-33	862	298	10	852	279	583	Gas
92		Holmes #3	9-47-33	868	294	18	850	285	583	Gas
93		Holmes #4	9-47-33	828	252			241	587	Gas
94		Holmes #5	9-47-33	802	226			213	589	Gas
95		Holmes #6	9-47-33	823	358			231	592	Gas
98	J. D. Judd & Co.	Klapmeyer #1 *	The following 34 wells are located in 120 acres which occupy all but the north 60 acres of the west ½ of Sec. 9-47-33	882	615	28	854	293	589	Dry

*

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
99		Klapmeyer #2		882	321	55	827	312	570	Aband. Gas
100		#3		886	323	45	841	312	574	Aband. Gas
101	J. D. Judd & Co.	#4		868	294	20	848	285	583	Aband. Gas
102	" " "	#5		836	269½			260	576	Aband. Gas
105	M. T. Drilling Co.	C. C. Klapmeyer #1		817	342⅛			232	585	Oil
107		" " #2		812	340			223	589	Oil
108		#3		815	340			248	567	Oil
109		#4		819	338			244	575	Oil
110		#5		819	339			254	565	Oil
111		#6		832	362			278	554	Oil
112		#7		821	342			263	558	Oil
113		#8		825	348			269	556	Oil
114		#9		819	349			260	559	Oil
115		#10		824	329			271	553	Oil
116		#11		815	341			242	573	Oil
117		#12		820	340			252	568	Oil
118		C.C.KLAPMEYER #13		821	345			259	562	Oil

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
119	M. T. Drilling Co.	C. C. Klapmeyer#14		813	340			241	572	Oil
120		#15		812	349					Oil
121		#16		827	355½			264	563	Oil
122		#17		826	355			270	552	Oil
123		#18		828	358			274	554	Oil
124		#19		823	350			260	563	Oil
125		#20		811.4	340			243	568	Oil
126		#21		818	360			237	581	Oil
127		#22		813	343			236	577	Oil
128		#23		815	355			228	587	Oil
129		#24		813	361			241	572	Oil
130		#25		814	361			243	571	Oil
131		#26		817	380			239	578	Oil
132		#27		818	355			235	583	Oil
133		#28								
134		C.C. KLAPMEYER #29								
140		Lydiard #1	9-47-33	874	543			306	568	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
141		Lydiard #2	9-47-33	844	385			265	579	Dry
142		McKibben #1	9-47-33	860	530			292	568	Dry
144		McKibben #3	9-47-33	847	596			273	574	Dry
145	Bartle & Marshall	Swafford #3	9-47-33	943	620	105	838	367	576	Gas
146	J. S. Holmes	Anderson # 1	10-47-33	881	733	43	838	312	569	Dry
147	Ruf Drilling Co.	Anderson # 1	10-47-33	954	440	114	840	372	582	Dry
148	Ruf Drilling Co.	Nannie Duck #1	10-47-33	959	431	109	850	373	586	Gas
149	Ruf Drilling Co.	Greaves #1	10-47-33	989	394½	146	843			
150	Ruf Drilling Co. (&) Bartle & Marshall	Jones #1	10-47-33	1003	404½	156	847	420 E	583 E	Gas
151	" "	Jones #2	10-47-33	1013	425	173	840	434 E	579 E	Gas
154	Ruf Drilling Co.	Pinkston #1	10-47-33	1017	675	176	841	441	576	Gas
155	Bartle & Marshall	Swafford #2	10-47-33	960	272	123	837	384 E	576 E	Gas
156		J. M. Pate	11-47-33	1036	703	221	815	482	554	Dry
157		Lee Erbe	12-47-33	1032	490	211	821	476	556	Dry
158	Green & Stephens	A. J. King #1	13-47-33	1000	470	134	866	393	607	Gas
159	Green & Stephens	A. J. King #2	13-47-33	986	617	124	862	385	601	Gas
160	Green & Stephens	A. J. King #4	13-47-33	1051	532	205	846	465	586	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
161		Geo. Spaw #1	13-47-33	1015	505	162	853	429	586	Dry
162	Louis Knoche	Ada Suleeba #1	13-47-33	994	635	122	872	380	614	Gas
163	Ruf Drilling Co.	John E. Shelton	14-47-33	1053	525	193	860	456	597	Dry
164	Ruf Drilling Co.	Farm City Inv.Co. Dave Long	15-47-33	972	475	137	835	402	570	Dry
165	Farm City Inv. Co.	Sleepy Hollow	15-47-33	995	199	173	822			Water
166	Ruf Drilling Co.	Ingraham Campbell #1	15-47-33	962	447½	117	845	387	575	Dry
167	" " "	" #2	15-47-33	948	500	104	844	371	577	Dry
168	" " "	#1 Mrs. R.J. Ingraham	15-47-33	1003	543	173	830	436	567	Dry
169	" " "	" " #2	15-47-33	1015	524	170	845	435	580	Dry
170	" " "	Wm. S. Swift	15-47-33	1007	555	172	835	433	574	Dry
171	Knobtown Dev. Co.	Coleman #1	16-47-33	883	409	50	833	313	570	
172	" " "	#2	16-47-33	888	416	54	834	316	572	
173	Skinner	W. Duck #1	* This and 8 following wells located in SE 40 of NW of 16-47-33	916	620	103	813	374	542	Oil
174	"	#2		840	34			269	571	Oil
175	"	#3		841	368			288	553	Oil
176	"	#4		825	346			251	574	Oil
177	"	#5		831	417			274	557	Oil

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
178	Skinner	W. Duck #6		910	443	86	824	361	549	Oil
179	"	#7		828	351			251	577	Oil
180	"	#8		928	452½	107	827	380	548	Oil
180A	Ruf Drilling Co.	Rosa Engleman	16-47-33	829	575			262	567	Dry
181	Knobtown Dev. Co.	Johnson # 1	16-47-33	883	400	42	841	306	577	Oil
182	" " "	" # 2	16-47-33	867	387	28	839	291	576	Oil
183	" " "	" # 3	16-47-33	890	413	60	830	324	566	Oil
184	" " "	" # 4	16-47-33	868	367	40	828	304	564	Oil
185	" " "	" # 5	16-47-33	881	403	48	833	313	568	Oil
186	" " "	" # 6	No Loc.	890	396	35	855	300	590	Oil
187	" " "	" #7	" "							
187A	" " "	Riedesel # 1	16-47-33	868	392	31	837	293	575	Oil
188	Brown & Knoche	Riepeto # 1	16-47-33	826	352			253	573	Dry
189	" " "	" # 2	16-47-33	891	440	60	831	323	568	Dry
190	Knobtown Dev. Co.	Russel # 1	16-47-33	873	413	35	838	298	575	Oil
191	" " "	" # 2	16-47-33	878	401	40	838	300	578	Oil
192		J. F. Bart # 1	17-47-33	894	600	86	808	359	535	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex.. Cap	Elev. base Lex. Cap	Type of Well
198		McPherson #1	17-47-33	907	600	103	804	362	545	
199		Wiser #1	17-47-33	862	585	41	821	299	563	Dry
200		Wiser #2	17-47-33	867	425	35	832	296	571	Dry
201		Ray Klapmeyer #2	18-47-33	985	450	175	810			Dry
202		Lawson #1	19-47-33	979	670	177	802	436	543	Aband. Gas
203		Lawson #2	19-47-33	935	407	131	804	401	534	Aband. Gas
204		Lawson #3	19-47-33	983	444	173	810	439	544	Dry
206		Louis Knoche #1	20-47-33	848	547			272	576	Gas
207		J. W. Bart	No Loc.	876	479			323	553	Dry
208	Louis Knoche	Carlson #1	21-47-33	1028	763	181	847	464	564	Dry
209	Louis Knoche	Carlson #2	21-47-33	1018	530	157	861	416	602	Oil
210	" "	" #3	21-47-33	979	515	127	852	385	594	Oil
211	" "	" #4	21-47-33	1018	544	163	855	424	594	Oil
212	" "	" #5	21-47-33	1006	510	161	845	423	583	Oil
213	" "	" #6	21-47-33	1013	538	171	842	439	574	Oil
214	" "	" #7	21-47-33	1015	538	162	853	419	596	Oil
215	" "	" #8	21-47-33	1011	532½	157	854	419	592	Oil

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
216	L. Knoche	Carlson #9	21-47-33	1024	544	171	853	443	581	Oil
217	"	" #10	21-47-33	1004	532	162	842	430	574	Oil
218	"	" #11	21-47-33	1020	408	162	858			Aband. Gas
219	"	" #12	21-47-33	1009	534	169	840	435	574	Oil
220	"	" #13	21-47-33	1021	540	172	849	441	580	Oil
221	K. & B. Oil & Gas Co.	" #14	21-47-33	993	557	169	824	450	543	Oil
222	" " "	" #15	21-47-33	994	520	152	842	422	572	Oil
223	" " "	" #16	21-47-33	1014	517	157	857	423	591	Dry
224	" " "	" #17	21-47-33	1005	555	171	834	441	564	Oil
X 225	" " "	" #18	21-47-33	985	655	138	847	403	582	Oil
(25) 226	"	Eames #1	21-47-33	944	580	65	879	328	616	Dry
227		#2	21-47-33	1003	439	157	846	426	577	Dry
228		#3	No. Loc. or elev.		375					Dry
229		Hoover	21-47-33	846	285			285	561	Dry
230		Pierson #1	21-47-33	975	402	129	846	392	583	Dry
231		" #2	21-47-33	950	445	99	851	364	586	Dry
232	Louis Knoche	Stuteville #1	21-47-33	1028	572	182	846	462	566	Oil

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
233	Knobtown Dev. Co.	Swells #1	21-47-33	996	513½	160	836	426	570	Oil
234	Knobtown Dev. Co.	" #2	21-47-33	974	506	143	831	406	568	Dry
235	" " "	" #3	21-47-33	984	505	148	836	413	571	Oil
236	" " "	" #4	21-47-33	947	467	112	835	376	571	Oil
237	" " "	" #5	21-47-33	900	423	60	840	319½	580½	Oil
238	" " "	" #6	21-47-33	941	460	100	841	359	582	Oil
239	" " "	" #7	21-47-33	999	495	131	868	395	604	Oil
240	" " "	" #8	21-47-33	979	497	139	840	402	577	Oil
241	" " "	" #9	21-47-33	982	509	151	831	414	568	Oil
244		Geo. Young #2	21-47-33	1024	556	171	853	435	589	Oil
246	Ruf Drilling Co.	Helen Diller	23-47-33	1003	685	133	870	390	613	Aband. Gas
247	" " "	Shelton Estate	23-47-33	1001	710	137	864	394	607	Aband. Gas
248	" " "	Bessie White	23-47-33	1038	536	205	833	459	579	Dry
249	Louis Knoche	Harry Byers #1	24-47-33	960	342	84	876	337	623	Gas
250	Stephens & Green	Clinkenbeard	24-47-33	964	437	97	867	354	610	Dry
251	Louis Knoche	Louis S. Cupp	24-47-33	993	702	127	866	382	611	Aband. Gas
252	Ruf Drilling Co.	Stella Diller #1	24-47-33	996	360	120	876	375 E	621 E	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
253	Ruf Drilling Co.	Stella Diller #2	24-47-33	987	430	111	876	370	617	Gas
254	Ruf Drilling Co.	" " #3	24-47-33	956	632	74	882	326	630	Gas
257	Green & Stephens	A. J. King (Miller) #3	24-47-33	992	367	124	868	380 E	612 E	Gas
258	Louis Knoche	Wintermite #1	24-47-33	923	308	43	880	302 E	621 E	Dry
259	Ruf Drilling Co.	Wintermute #1	24-47-33	933	524	55	878	307	626	Dry
260	Louis Knoche	F. H. Glover	25-47-33	1007	720	139	868	399	608	Gas
261	Louis Knoche	Orear #1	25-47-33	919	561	35	884	292	626	Gas
262	" "	" #2	25-47-33	928	319	57	871	314	614	Gas
264		Bybee	26-47-33	999	252	168	831			Water
265	Louis Knoche	E.W. Crutcher	26-47-33	988	475	139	849	397	591	Dry
269	" "	E.C. Maxwell	27-47-33	1073	392	242	831			Dry
270	R. & S. Drilling Co.	C.S. Lovejay #1	28-47-33	879	370	69	810	329	550	Dry
271	" " "	" " #2	28-47-33	920	356			351	569	Dry
272	Royce & Stephens Drg.Co.	Weber #1	28-47-33	917	350½	75	842	334	583	Gas
273	" "	" #2	28-47-33	933	370			353	580	Gas
274	" "	" #3	28-47-33	976	396	120	856	389	587	Gas
275	" "	" #4	28-47-33	1013	442			426	587	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
276	Royce & Stephens Drg.Co.	Goldie Goodman #1	29-47-33	904	628	91	813	375	529	Dry
277		" " #2	29-47-33	852	322	31	821	292	560	Gas
278	W. T. Kemper	Red Fox Farm	32-47-33	1024	433	172	852	432	592	Gas
279	L. Knoche	J. F. Jones #2	33-47-33	1072	350	200	872			Dry
280	J. D. Judd	J.P. Porter #1	33-47-33	1030	553	173	857	439	591	Dry
281	Louis Knoche	Otto Gerhand	34-47-33	1018	421	152	866	415	603	Gas
282	J. D. Judd	McSpadden	34-47-33	1057	515	216	841	497	560	Dry
283	Louis Knoche	Mullin & Berry	34-47-33	1081	514	227	854	478	603	Dry
284		W.B. Browning	35-47-33	989	370	130	859			Dry
285		Browning & Johnson	35-47-33	1008	516	145	863	407	601	Dry
286	Ruf Drilling Co.	W.D. Johnson	35-47-33	977	658	108	869	382	595	Dry
287		Johnson # 1	36-47-33	1071	478	208	863	470	601	Dry
288		Robertson	36-47-33		276					
9										

Addenda
T. 47 - R. 33

Map No. of Loc.	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B. F.	Elev. Top B. F.	Depth Base My. Sta.	Elev. Base My. Sta.	Type of Well
292		Norris	6-47-33	945	158	125	820	----	556 E	Dry
293	J. D. Judd & Son	C. C. Klapmeyer#8	7-47-33	941	537½	131	810	395	546	Oil
294	" " "	C. C. Klapmeyer2W	9-47-33	820	940	---	---	225	595	DeepWater
295	" " "	Campbell	9-47-33	865	400	---	---	270	595	Dry
291	W. T. Kemper	Red Fox Farm	32-47-33	1040	232	227	813	---	553 E	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
			T.48 - R. 29							
1		Oak Grove School	5-48-29	900	497			158	742	Water
2		Morrison	21-48-29	1016	200	4	1012			Water
3	J. D. Judd	N. Keller	28-48-29	880	325			137	743	Dry
T.			T.48 - R. 30							
1		Sni-A-Bar Farms	4-48-30	962	875			285	677	Dry
2		J. D. Selvey	8-48-30	885	580			223	662	Dry
3		C.L.M. St. Clair	8-48-30	955	393	52	903	288	667	Dry
4		S.E. Armstrong	14-48-30	835	480			148	687	Dry
5	A. E. Hale	Strother	18-48-30	960	550	64	896	302	658	Dry
6		L. C. Worth	19-48-30	947	200	35	912			Water
12		Earhart	29-48-30	963 +	400	27	936	268	695	Dry
7		Lon Holland #1	30-48-30	949	690	20	929	260	689	Dry
8		Bruce Dodson	32-48-30	944	280			250	694	Water
10	Lone Jack Oil & G. Co.	W. T. Alley	33-48-30	967	560			250	717	Dry
11	" " "	Moore	34-48-30	962	400	49	913	300	662	Dry
9										

Addenda
T. 48 - R. 29

Map No. of wc..	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B. F.	Elev. Tpp B. F.	Depth Base My. Sta.	Elev. Base My. Sta.	Type of Well
4		Pugh	32-48-29	971	656	8	963	279	692	Water

Addenda
T. 48 - R. 30 W

Map No. of Loc.	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B. F.	Elev. Top B. F.	Depth Base My. Sta.	Elev. Base My. Sta.	Type of Well
15		R. Epple	25-48-30	860	150					Water
14		Mrs. M. Thompson	29-48-30	968	120	46	922	---	681 E	Water
16		Campbell	29-48-30	925	125				695 E	Water
17		Bob Shutts	30-48-30	959	212	43	916	---	675 E	Water
18		Hal Phillips	31-48-30	899	125	5	894	---	653 E	Water
19		H. Oppenheimer	31-48-30	928	201	27	901	---	660 E	Water

7-1-a
12-2

T.48 - R. 31

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
1		F. A. Morris	1-48-31	937	370	46	891	283	654	Dry
2		A. B. Lease	2-48-31	910	490	22	888	275	635	Dry
3		Robt Lightburn	2-48-31	879	412	31	848	274	605	Dry
5		Gilham Dalton #1	4-48-31	899	362½	30	869	276	623	Dry
6		" " #3	4-48-31	906	400	37	869	288	618	Dry
7		Turner	4-48-31	882	480	2	880	250	632	Dry
8		T. C. Howard #4	7-48-31	931	400	60	871	313	618	Dry
9		R.M. Howard #3	8-48-31	947	270	51	896	300 E	647 E	Dry
10		T.C. Howard #2	8-48-31	906	347	10	896	258 E	648 E	Dry
11		T. C. Howard #3	8-48-31	909	227	20	889	269 E	640 E	Gas
12		T. C. Howard #5	8-48-31	963	310	96	867	347 E	616 E	Dry
13		Theodore Pressly	8-48-31	893	381	27	866	276	617	Dry
14		Tilham Dalton #2	9-48-31	901	360	29	872	277	624	Dry
15		Ed. Goodloe	9-48-31	929	410	56	873	306	623	Dry
16		John R. Leinweber #1	9-48-31	905	331	11	894	258	647	Gas
17		" " #2	9-48-31	894	335	14	890	251	643	Gas
18		" " #3	9-48-31	879	345	5 -	874 -	248	631	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
19		John R. Leinweber #4	9-48-31	912	385	37	875	291	621	Dry
20		W. A. Shreeve #1	9-48-31	975	437	105	870	347	628	Dry
21		" " #2	9-48-31	962	429			346	616	Dry
22		Dr. Combs	10-48-31	886	317½	2	884	237	649	Gas
23	J. D. Judd & Son	H. N. Cordson #1	10-48-31	915	532	17	898	264	651	Dry
24		" " #2	10-48-31	918	346	33	885	268	650	Gas
25		Geo. H. Hughes #4	10-48-31	817	225			138	679	Gas
26		Hulse #1	10-48-31	916	360	22	894	262 E	654 E	Dry
27		Newton # 1	10-48-31	794	255			176	618	Dry
28		Sweet #1	10-48-31	892	322			241 E	651 E	Gas
29		Sweet #2	10-48-31	843	228½			194	649	Gas
30		Toute	10-48-31	913	341	24	889	265	648	Gas
31		Watson #1	10-48-31	814	385			174	640	Dry
32		" #2	10-48-31	801	224			139	662	Gas
33		Wolfe #1	10-48-31	930	360	45	885	278	652	Gas
34		J.F. Baird #1	11-48-31	863	279			190	673	Gas
35		" " #2	11-48-31	846	445			188	658	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
36		J.F. Baird #3	11-48-31	905	503	23	882			Dry
37	J. D. Judd & Co.	" " #5	11-48-31	903	326	3 +	900 +	234	669	Gas
38		" " #6	11-48-31	898	390	39	859	284	614	Dry
39		Geo. F. Hughes #1	11-48-31	918	347	9 +	909 +	240	678	Gas
40		" " #2	11-48-31	892	325			239	653	Gas
41		" " #3	11-48-31	916	349			235	681	Gas
44		J.F. Baird #4	14-48-31	939	375	20	919	272	667	Gas
44A		J. O. Boten #3	14-48-31	918	340	5	913	242	676	Gas
45		C. P. Fann	14-48-31	840	280			189	661	Gas
46	J. D. Judd & Co.	E. H. Graves #2	14-48-31	966	390	42	924	279	687	Gas
47		" " #3	14-48-31	944	357½	21	923	261	683	Gas
48		" " #4	14-48-31	900	505	3 +	897 +	235	665	Gas
49		" " #5	14-48-31	940	369	26	914	267	673	Gas
50		" " #6	14-48-31	938	367	32	906	268	670	Gas
51		" " #7	14-48-31	902	484	0	902 +	228	674	Gas
52	Mo.-Kan. Pipe Line Co.	" " #8	14-48-31	932	360	20	912	259	673	Gas
53	" " " "	" " #9	14-48-31	917	333			238	679	Gas

Well

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Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
54	Mo.-Kan. Pipe Line Co.	E. H. Graves #10	14-48-31	932	358	12	920	252	680	Gas
55	" " "	" " " #11	14-48-31	953	385	32	921	270	683	Gas
56	J. D. Judd & Co.	Graves 1B	14-48-31	958	800	41	917	275	683	Dry
57		Half Hill Jennings #1	14-48-31	910	334	6 -	904 -	237	673	Gas
58		Ogilvie #1	14-48831	900	360	0	900 -	245	655	Dry
59		E. T. Richardson	14-48-31	940	358	15	925	255	685	Gas
60	J. D. Judd & Co.	J.F. Baird #7	15-48-31	916	333½			247	669	Gas
61		J.O. Boten #2	15-48-31	972	382½	40	932	277	695	Gas
62		C.T. Johnson	15-48-31	912	343	9 -	903	249	663	Gas
63		J.R.Leinweber#5	15-48-31	818	415			156 E	662 E	Dry
64		Fred Lund #1	15-48-31	965	375½	25	940	273	692	Gas
65		" " #2	15-48-31	943	660	19	924	250	693	Gas
66		R.T. Thornton #1	15-48-31	937	338½	8	929	251	686	Gas
67		" " #2	15-48-31	958	383	28	930	282	676	Gas
68		" " #3	15-48-31	938	370	21	917	276	662	Gas
69		W. H. Grounds #1	16-48-31	935	455	49	886	294	641	Dry
70		R.M. Howard #1	17-48-31	948	242	49	899			Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
71		R.M. Howard #2	17-48-31	957	447	86	871	330	627	Dry
72		T.C. Howard #1	17-48-31	960	445	78	882	332	628	Dry
73		Lohr	19-48-31	955	123	71	884			Water
75		J.M. Brown	20-48-31	986	406	112	874	347	639	Dry
76		John Leinweber #1	20-48-31	997	600	122	875	360	637	Gas
77		Martin Leinweber #1	21-48-31	905	515			262	643	Dry
78		" " #2	21-48-31	925	358			278	647	Dry
80		H.M. Twis #1	21-48-31	912	385	45	867	287	625	Dry
81		Chas. Boten #1	22-48-31	934	344	12 ±	922 ±	241 E	693 E	Gas
82		Chas. Boten #2	22-48-31	924	340	0	924	231	693	Gas
83		J. O. Boten #5	22-48-31	956	357	26	930	257	699	Gas
84		T.J. Boten #1	22-48-31	950	408	23	927	257	693	Dry
85	Roy Lynds	T.J. Boten	22-48-31	962	395	34	928	266	696	Dry
86		J.O. Boten #1	23-48-31	956	366	36	920	267	689	Gas
87		" " #4	23-48-31	939	367	33	906	265	674	Gas
88		" " #6	23-48-31	955	390	36	919	271	684	Gas
89	Roy E. Lynds	Lydia F.Fowkes #1	23-48-31	942	380	27	915	258	684	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
90	Roy E. Lynds	Lydia F. Fowkes#2	23-48-31	947	382	18	929	252	695	Gas
91		E.H. Graves #1	23-48-31	973	529	44	929	279	694 E	Gas
92		E.H. Graves #12	23-48-31	983	530	52	931	286	697	Gas
93	Roy Lynds Dev. Co.	F.I. Thommiribu #1	23-48-31	954	521	43	911	276	678	Gas
94	" " "	" " #2	23-48-31	923	355	20	903	250	673	Gas
95	" " "	" " #3	23-48-31	946	535	30	916	267	679	Gas
96	" " "	" " #4	23-48-31	968	400	46	922	284	684	Gas
96A	A. E. Hale	Wyatt Heirs #1	23-48-31	965	405	48	917	279	686	Dry
97		J.H. Freeman #1	24-48-31	1001	465	112	889	352	649	Dry
98		Palmer #1	24-48-31	958	540	55	904	283	676	Dry
99		" #2	24-48-31	961	510	32	929	286 E	675 E	Dry
100	Breisch et al	R.T. Thornton #3	24-48-31	988	540	61	927	294	701	Dry
101	" "	" " #4	24-38-31	976	413½	52	924	283	701	Dry
102		Wallace	25-48-31	992	470	100	892	331	661	Gas
103		Blackwell #2	26-48-31	956	405			225 E	731 E	Gas
104		" #3	26-48-31	995	380	81	914	327	668	Dry
105		" #4	26-48-31	974	415	45	929	289	685	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
106		McCarey #1	26-48-31	966	530	35	931	260 E	706 E	Dry
107		" #2	26-48-31	967	440	30	937	258	709	Gas
108		E. Williams #1	26-48-31	930	340	2	930	246 E	715 E	Dry
110		H. E. Bailey	27-48-31	829	450					Dry
111		J. Blackwell #1	27-48-31	984	415	34	950	270 E	714	Gas
112		" " #5	27-48-31	961	315	24	937	250 E	711	Dry
113		Florence	27-48-31	928	225	34	894			Dry
114		Tod M. George	27-48-31	905	375	18	887	263	642	Dry (W)
116		Oscar Boten #1	28-48-31	967	705	68	899	314	653	Dry
117		" " #2	28-48-31	988	301	80	908			Dry
119		J.W. Stone #1	28-48-31	966	400	60	906	311 E	655 E	Gas
120		" " #2	28-48-31	983	408	84	899	326	657 E	Gas
121		" " #3	28-48-31	968	265	96	886			Dry
123	V. D. Boyd	N.W. Boyd #1	29-48-31	987	290	60	927	307 E	680 E	Gas
124	" "	" " #2	29-48-31	976	269	46	930	293 E	683 E	Gas
125	" "	" "	29-48-31	960	249	42	918	289 E	671 E	Gas
126	Gene & Ragsdale	Fee #1	29-48-31	949	271	22	927	269 E	680 E	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
127	Gene & Ragsdale	Fee #2	29-48-31	959	275	32	927	279 E	680 E	Gas
128	" "	" #3	29-48-31	977	285	49	928	296 E	681 E	Gas
130	" "	" #5	29-48-31	986	265	40	944	289	697 E	Gas
131		Wm. Dark #1	29-48-31	965	368	54	911	298	667	Gas
132		J. Dark #1	29-48-31	949	375	51	898	296	653	Gas
133		Lee #1	29-48-31	1002	545	81	921	333	669	Dry
135		John R. Leinweber #1	29-48-31	983	267	55	928	302 E	681 E	Gas
136		" " #2	29-48-31	963	244	40	923	287 E	676 E	Gas
137		Moberly #1	29-48-31	993	265	65	928	312 E	681 E	Gas
138		Josephine D. Rice #1	29-48-31	967	242	39	928	286 E	681 E	Gas
139		" " #2	29-48-31	977	260	50	927	297 E	680 E	Gas
140	Jeffries & Newberg	H. L. Ritter #1	29-48-31	971	265	44	927	291 E	680 E	Gas
141	" " "	" " #2		982	270	58	923	305 E	677 E	Gas
144	Unity School of Christianity	Unity Farm #47	30-48-31	967	560	52	915	315	652	Dry
145	Lees Summit O. & G. Co.	Maude M. Allen	31-48-31		425	110		363		Dry
146	Newberg & Jeffres	Ben D. Allen #1	32-48-31	989	272	58	931	308 E	681 E	Gas
147	" " "	" #2	32-48-31	965	275	31	934	281 E	684 E	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
148	Newberg & Jeffries	Ben D. Allen #3	32-48-31	973	280	55	918	305 E	668 E	Gas
149		R. T. Ritter	32-48-31	974	256	44	930	294 E	680 E	Gas
150	Newberg & Jeffers	R.E. Ritter #1	32-48-31	1000	535	84	916	325	675	Gas
151	" "	" " #2	32-48-31	993	553	63	930	316	677	Gas
152	" "	" " #3	32-48-31	973	267	49	924	296 E	677 E	Gas
153	" "	" " #4	32-48-31	979	266	48	931	295 E	684 E	Gas
154	" "	" " #5	32-48-31	981	264	50	931	297 E	684 E	Dry
155	R. E. Ritter	" " #6	32-48-31	996	279	66	930	313 E	683 E	Dry
156		J.V. Rowell #4	32-48-31	995	255	64	931	311 E	684 E	Dry
157		J.V. Rowell #5	32-48-31	996	267	62	934			Dry
158	Jeffers-Newberg-Ritter	Scruggs	32-48-31	994	279	62	932			Dry
160		Short	33-48-31	956	375	28	928	280	676	Dry
161	Newberg-Jefferies-Ritter	Tudor	33-48-31	936	400	14	922	260	676	Dry
162		Colborn	34-48-31	949	401	60	889	299	650	Dry
163		Dr.EdwardN.Thiesson	34-48-31	926	294	43	883	291	635	Water
#1										
#2										

Addenda
T. 48 - R. 31

Map No. of Loc..	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B. F.	Elev. Top B. F.	Depth Base My. Sta.	Elev. Base My. Sta.	Type of Well
164	Ruf Drilling Co.	Michaels	6-48-31	907	475	45	862	282	625	Gas
165	" " "	Henry Ess 1A	6-48-31	889	465	32	857	270	619	Gas
166	" " "	" " 2A	6-48-31	906	490	48	858	291	615	Dry
167	" " "	" " 3A	6-48-31	910	500	50	860	291	619	Dry
168	" " "	Mayer	6-48-31	887	485	52	835	292	595	Dry
169	" " "	Dr. Rice (Adams)	6-48-31	899	475	41	858	289	610	Gas
173	" " "	W. L. Yost	7-48-31	918	475	39	879	278	640	Dry
174	" " "	Hoyt	7-48-31	807	388	---	-----	Cut out Warrensburg		Dry
170	Johenda	Henderson & Worman	8-48-31	937	500	48	889	" "	"	Dry
171	Ruf Drilling Co.	" " #1	8-48-31	905	500	45	860	295	610	Dry
172	"	" " #2	"	878	475	33	845	285	593	Dry
176	"	" " #3	"	852	450	--	--		593 E	Dry
177	"	" " #4	"	900	462½	40	860	289	611	Dry
178	"	" " #5	"	838	428	---	---	236	602	Gas
179	"	" " #6	"	924	690	64	860	315	609	Dry
180	"	" " #7	"	819	428	--	--	218	601	Dry
181	"	K.C. Life Ins.Co.	8-48-31	866	444	9	857	255	611	Gas

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Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
			T.48-R.32							
304	Ruf Drilling Co.	Thos. Conway #2	1-48-32	782	352			151	631	Aband. Gas
306	" " "	" " #3	1-48-32	785	355			155	630	Aband. Gas
309	" " "	Henry N. Ess #1	1-48-32	918	500	51	867	297	621	Aband. Gas
311	" " "	" " " #2	1-48-32	914	505	45	869	280	634	Dry
312	" " "	" " " #3	1-48-32	875	445	10	865	251	624	Aband. Gas
313	" " "	" " " #4	1-48-32	891	467	30	861	269	622	Aband. Gas
301	" " "	Wm. B. Frey	1-48-32	781	431			154	627	Dry
305	" " "	K.C. Life Ins.Co. #1	1-48-32	782	510			151	393	Dry
308	" " "	Wahl #1	1-48-32	908	488	41	867	282	626	Aband. Gas
1	" " "	W.B. Chauncey #2	2-48-32	814	375½			181	633	Aband. Gas
297	" " "	Thomas Conway	2-48-32	808	415			193	615	Dry
300	Hulse & Christopher	Hillman	2-48-32	885	459	19	866	268	617	Dry
1A	Ruf Drilling Co.	Katie Lahey #1	2-48-32	804	377			179	625	Aband. Gas
303	" " "	" " #2	2-48-32	813 -	365½			182		Aband. Gas
299	Hulse & Christopher & Harmel, et al	Maloney #1	2-48-32	802	362			171	631	Aband. Gas
302	Ruf Drilling Co.	Chas. Norman	2-48-32	786				161	615	Aband. Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
298	Ruf Drilling Co.	John Wright #1	2-48-32	791	350			155	636	Dry
2		Geogge Jennings #1	3-48-32	966	625	138	828	387	579	Dry
3	Scafe Drilling Co.	Cassel Est. #1	4-48-32	1001	470	133	868	377	624	Aband. Gas
4		O.J. Greene #1	4-48-32	969	465	120	849	369	600	Dry
51	J. D. Judd & Co.	Short #1	4-48-32	1011	475	146	865	390	621	Aband. Gas
6		Stafford #1	4-48-32	1017	485	157	860	402	615	Aband. Gas
8	M.T. Drilling Co.	H. Linger #1	5-48-32	1033	455	188	845	420	613	Gas
9	Raytown Motor Co.	Fee #1	5-48-32	1028	520	164	864	406	622	Dry
10		Luther Robinson #1	5-48-32	1010	396	146	864	392	618	Dry
11		" " #2	5-48-32	1013	500	145	868	393	620	Dry
14	Skyline Cafe	Fee	6-48-32	924	150	74	850			Water
15	Sypo Water Co.	Fee	6-48-32	988	170	141	841			Water
16	John J. Blair	Fee Deep Test #1	7-48-32	929	2401	70	859	323	606	Dry
17	Chas. N. Bronston	Fee #1	7-48-32	967	660	114	853	364	603	Dry
18		Noll	7-48-32	911	360			318	593	Gas
19	Turner Realty Co.	Fee #3	7-48-32	1032	546½	185	847	440	592	Dry
20	Laurel Heights Tavern	Fee	8-48-32	1034	127	165 E	859 E			Water

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
22	Turner Realty Co.	Fee #2	8-48-32	1023	520	178	845	425	598	Dry
23	R.E. Elliott Shooting Park	#1	8-48-32	1011	468	131	880	373	638	Gas
24		C. H. Walker #4	8-48-32	1014	476'8"	144	870	387	627	Gas
25		#1 Greene Homestead	9-48-32	947	410	52	895	298	649	Gas
26		McInteer #1	9-48-32	978	445	87	891			Gas
27		McInteer #2	9-48-32	951	410	65	886	329	622	Gas
29		F. L. Mitchner #1	10-48-32	903	409	36	867	282	621	Dry
31	Jake Weiser	Hadda M. Frey #2	300' W of #3	791	557½			171	620	Dry
31A	Jake Weiser	Hadda M. Frey #3	11-48-32	790	1100			172	618	Dry
307	Ruf Drilling Co.	Geo. T. Chimary#1	12-48-32	929	516	58	871	302	627	Dry
32		W. L. Yost	12-48-32	953	717	71	882	309	644	Dry
33		A.A. Hendrickson	13-48-32	916	540	22	894	263	653	Dry
34		S. Fetter #1	15-48-32	946	392	40	906	293	653	Gas
35		" #3	15-48-32	926	382	20	906	266	660	Gas
36		J.M. Frost #1	15-48-32	914	385	44	870	264	650	Dry
37		" " #2	15-48-32	931	391	41	890	282	649	Dry
38		John Mauser	15-48-32	909	375	28	881	271	638	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
39		A.G.Robinson #1	15-48-32	921	360	17	904	259	662	Gas
40		" " #2	15-48-32	907	360	7	900	248	659	Gas
41		J.B. Searcy #1	15-48-32	933	385	43	890	286	647	Gas
42		" " #2	15-48-32	939	390	42	897	287	652	Gas
43		" " #3	15-48-32	939	401'2"	47	892	289	650	Dry
44	J.D. Judd & Co.	H.W. Storms #1	15-48-32	966	448	75	891	318	648	Gas
46	Pettit & Wilson	Anderson #1	16-48-32	916	384	20	896	268	648	Gas
47	" "	" #2	16-48-32	946	415	48	898	292	654	Gas
48	" "	" #3	16-48-32	934	384	20	914	268	666	Gas
49		Bollinger #1	16-48-32	933	379	31	902	279½	654	Gas
50		E. Brown #1	16-48-32	983	426	75	908	322	661	Gas
51		Joe Cassetta	16-48-32	984	429½	78	906	320	664	Gas
52	Mo.-Kan. Pipe Line Co.	Cox #1	16-48-32	992	428½	81	911	329	663	Gas
53	" " " "	" #2	16-48-32	978	422	71	907	313	665	Gas
54	" " " "	" #3	16-48-32	951	393	44	907	288	663	Gas
55	" " " "	" #4	16-48-32	944	393	43	901	288	656	Gas
56	" " " "	" #5	16-48-32	994	450	90	904	335	659	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
57	Mo.-Kan. Pipe Line Co.	Cox #6	16-48-32	1003	459	109	894	352	651	Gas
58	" " " "	" #7	16-48-32	982	435	87	895	331	651	Gas
59		J.F. Davis #1	16-48-32	957	392	53	904	297	660	Gas
60		J.F. Davis #2	16-48-32	943	388	40	903	282	661	Gas
62		A. Debrot #2	16-48-32	941	394	45	896	288	653	Gas
63		R. Dehoney #1	16-48-32	963	413	66	897	308	655	Gas
64		R. Dehoney #2	16-48-32	1001	460	110	891	355	646	Gas
65		R. Dehoney #3	16-48-32	964	414'6"	75	889	315	649	Gas
66		C. Fetters #1	16-48-32	963	405	55	908	298	665	Gas
67		S. Fetters #2	16-48-32	965	400	62	903	301	664	Gas
68		S. Fetters #4	16-48-32	955	660	47	908	290	665	Dry
69		Larson #1	16-48-32	961	412	60	901	305	656	Gas
70		Schneider #1	16-48-32	950	403	50	900	297	653	Gas
71		Schneider #2	16-48-32	933	380	34	899	275	658	Gas
72		J.A. Brizendine#1	17-48-32	952	404	60	892	299	653	Gas
73	Pettit, et al	" " #2	17-48-32	957	414	65	892	312	645	Gas
74		C. H. Cole #1	17-48-32	926	380	33	893	277	649	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
75		C. H. Cole #2	17-48-32	923	380	32	891	271	652	Gas
76		Fehrman #1								Dry
77		Fehrman #2	17-48-32	1007	463	123	884	366	641	Gas
78		Mrs. Greene #1	17-48-32	976	417	74	902	322	654	Gas
79		H. Greene	17-48-32	1011	460	118	893	356	655	Gas
80		O. J. Greene	17-48-32	981	416	75	906	317	664	Gas
81		Laura Muir	17-48-32	1013	469	127	886	366	647	Gas
82		Pendleton #1	17-48-32	956	402'4"	58	898	301	655	Gas
83		Pendleton #2	17-48-32	959	404	56	903	307	652	Gas
84		Pendleton #3	17-48-32	937	390	39	898	285	652	Gas
85		Pendleton #4	17-48-32	945	404	55	890	301 E	644 E	Gas
86		J. Russell #2	17-48-32	939	403	49	890	295	644	Gas
87		J. Russell #3	17-48-32	930	386	36	894	282	648	Gas
88		N.J. Sechrest Est. #1	17-48-32	972	425	97	875	347	625	Gas
89		" " #2	17-48-32	953	409	71	882	315	638	Gas
90		" " #4	17-48-32	983	435	101	882	351	632	Dry
91	Cooperative Petr. Co.	Stevenson #1	17-48-32	1001	437	102	899	342	659	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
92		C.H. Walker #1	17-48-32	988	446	110	878	360	628	Dry
93		" " #2	17-48-32	1017	500	156	865	401	616	Dry
94		" " #3	17-48-32	1027	515	162	865	412	615	Dry
95	Ragan	Estes #3	18-48-32	970	450	110	860	365	605	Dry
96	"	" #4	18-48-32	1012	469	132	880	376	636	Dry
97		N.J. Sechrest #1	18-48-32	1010	500	123	887	384	626	Gas
98		" " #2	18-48-32	911	390	35	876	282	629	Gas
99		" " #3	18-48-32	878	346	6	872	251	627	Dry
100		Bryant	18-48-32	1041	512	154	887	398	643	Gas
101	Ragan	Estes #1	19-48-32	1008	463	116	892	360	648	Gas
103		E.E. Hall #1	19-48-32	1002	463	110	892	357	645	Gas
104		E.E. Hall #2	19-48-32	1003	454	99	904	350	653	Gas
105		E.E. Hall #3	19-48-32	1006	449	106	900	355	651	Gas
106		G. Ragan #6	19-48-32	1040	504	160	880	412	628	Gas
107	Co-op. Petroleum Co.	L.M.Dehoney #1	20-48-32	938	391	43	895	290	648	Gas
108	" " "	" " #2	20-48-32	966	418½	72	894	322	644	Gas
109	" " "	" " #3	20-48-32	980	680	90	890	338	642	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
110		Duncan #2	20-48-32	894	347	3	891	240	654	Gas
111	Grogger	Beverley #1	20-48-32	962	259½	12	850			Gas
112		Florence Grogger #1	20-48-32	910	410	46	868	293	621	Dry
113		George Grogger #1	20-48-32	947	425	70	877	322	625	Dry
114		F.B. Grogger #1	20-48-32	927	520	18	909	265	662	Gas
115		" " #2	20-48-32	943	398	52	891	298	645	Gas
116		Rhodes #1	20-48-32	936	398	46	890	295	641	Gas
117		G.W.Sechrest #1	20-48-32	945	394	49	896	292	653	Gas
118		" " #2	20-48-32	938	399	41	897	285	653	Gas
119		Frank X. Wachter #1	20-48-32	969	430	84	885	332	637	Gas
120		" " " #2	20-48-32	993	465	119	884	364	629	Dry
121	Ruf Drilling Co.	Ralph Byrne #1	21-48-32	801	425			153	648	Gas
122		A. Debrot #1	21-48-32	911	366½	20	891	266	645	Gas
123		Ellison #1	21-48-32	943	415	63	880	309	634	Dry
124		C. W. Erwin #1	21-48-32	922	380	37	885	289	633	Gas
125		" " #2	21-48-32	931	405	43	888	294	637	Dry
126	Mo. National Guard	Military Co Club #1	21-48-32	840	296			186	654	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
127		Robinson #1	21-48-32	950	365	47	903	294	656	Gas
128		" #2	21-48-32	910	364	13	897	255	655	Gas
129		Turner #1	21-48-32	946	396	47	897	291	653	Gas
130		" #2	21-48-32	911	360½	112	899	260	651	Gas
131		" #3	21-48-32	917	363½	21	896	267	650	Gas
132		George W. Walkenhorst #1	21-48-32	800	155			146	654	Gas
133		" " #2	21-48-32	796	245			135	661	Gas
134		" " #3	21-48-32	805	259			132	673	Gas
135	Ruf Drilling Co.	Walkenhorst #1	21-48-32	798	388			142	656	Gas
136		M.T. White #1	21-48-32	945	400	49	896	297	648	Gas
137		M.T. White #2	21-48-32	932	403	38	894	287	645	Dry
138		Anderson #1	22-48-32	823	245			141	682	Gas
139		" #2	22-48-32	810	270½			143	667	Gas
140		" #3	22-48-32	800	246			136	664	Gas
141		" #4	22-48-32	826	273			145 E	681 E	Gas
213		Burton #1	22-48-32	805	243			134	671	Gas
143		M. Fetters	22-48-32	815	285			165	650	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
144		M. Fetter #2	22-48-32	938	396	47	891	290	648	Dry
145		Goldie Frost #1	22-48-32	941	555	38	903	294	657	Gas
146	B. F. Hammel	Hammel	22-48-32	836	?			187	649	Gas
147		F.K. Harrison #1	22-48-32	902	345	5	897	246	656	Gas
148		" " #3	22-48-32	917	370	6	911	261	656	Dry
150		" " #5	22-48-32	910	365	15	895	262	648	Gas
151		C.B. Lorenz #1	22-48-32	829	269½			165	664	Gas
152		" " #2	22-48-32	809	258			144	665	Gas
153		A. Meyer #1	22-48-32	802	254½			140	662	Gas
154	Knobtown Service Co.	C.Pfeiffer #1	22-48-32	802	250			135	667	Gas
155	" " "	" #2	22-48-32	804	269			136	668	Gas
157	" " "	E. Schock #1	22-48-32	805	257			140	665	Gas
158	" " "	" " #2	22-48-32	805	253			138	667	Gas
159	" " "	" " #3	22-48-32	807	255			144	663	Gas
159 A	United Brick & Tile Co.	E. W. Simon #1	22-48-32	798	403			141	657	Gas
160	" " "	" " #2	22-48-32	803	233			136	667	Gas
161	" " "	" " #3	22-48-32	801	227½			135	666	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
162	United Brick & Tile Co.	E. W. Simon #4	22-48-32	806				141	665	Gas
163	" " "	" " #5	22-48-32	803				145	658	Gas
164	" " "	Fee #3	22-48-32	807	250			140	667	Gas
165	" " "	Fee #13	22-48-32	793	380			129	664	Gas
166	" " "	Fee #14	22-48-32	806	247			144	662	Gas
233	" " "	Fee #2	22-48-32	804	341			134	670	Gas
167		Geo. E. Walleck Jr. #1	22-48-32	943	300	33	910	300	686	Gas
168		J.J. DeGroff #1	23-48-32	913	385	31	882	280	633	Dry
169	United Brick & Tile Co.	Englar #1	23-48-32	939	520	31	908	281	658	Gas
170	Kans. Oil & Gas Co.	Hartman #1	23-48-32	794	225			144	650	Gas
171	United Brick & Tile Co.	B.F. Holliday #1	23-48-32	927	370	22	905	274	653	Gas
172	" " "	" " #2	23-48-32	926	372	26	900	270	656	Gas
173	Skidler Bros.	C. Holliday	23-48-32	800	242			142	658	Gas
174		T. E. Jones #1	23-48-32	932	613	30	902	272	660	Dry
175		" " #2	23-48-32	948	442	33	915	279	669	Gas
176	United Brick & Tile Co.	Jones #1	23-48-32	955	381	40	915	284	671	Dry
177	Kans. Oil & Gas Co.	Jones #1	23-48-32	954	383	36	918	273	681	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
178	Kans. Oil & Gas Co.	Jones #2	23-48-32	956	384	40	916	280	676	Gas
179	" " "	" #3	23-48-32	942	130	40	902			Dry
180		Chris Pfeiffer	23-48-32	802	246			148	654	Gas
183		Seiler #1	23-48-32	802	252			148	654	Gas
184		Zimmerman	23-48-32	805				159	646	Dry
187	Unity School of Christianity	Unity #44 Farm	24-48-32	900	461	4	896	265	635	Dry
188	" " "	Unity Farm #45	24-48-32	962	520	51	911	307	655	Dry
189	" " "	" " #1	25-48-32	967	445	68	899	309	658	Oil
192	" " "	" " #12	25-48-32	950	1510	68	882	309	641	Dry
194	" " "	" " #40	25-48-32	952	434	50	902	330	622	Dry
195	" " "	" " #41	25-48-32	965	435			332	633	Dry
196	" " "	" " #42	25-48-32	913	400			303	611	Oil
197	" " "	" " #43	25-48-32	962	235	55	907			Dry
198	" " "	" " #48	25-48-32	961	520	52	909	309	652	Dry
310	" " "	" " #49	25-48-32	975	515	69	906	305	670	Dry
199		Dean Borman	26-48-32	820	253			162	658	Gas
200		Mrs. Davis	26-48-32	938						Water

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
203		R. A. Posch #2	26-48-32	861	290			199	662	Gas
205	Unity Sch. of Christianity	Unity Farm #36	26-48-32	935	364	20	915	265	670	dry
208	" " "	Unity Farm #39	26-48-32	940	385	27	913	271	669	Gas
209	Knobtown Development Co.	Brown #1	27-48-32	795	235			120	675	Gas
210	" "	" #2	27-48-32	804	248			129	675	Gas
211	Hulse & Christopher	" #3	27-48-32	797	410			123	674	Gas
212	" " "	" #4	27-48-32	810	361			135	675	Gas
214	Knobtown Develop. Co.	Burton #2	27-48-32	816	259			142	674	Gas
215		Joel Cook #1	27-48-32	913	356½			242	671	Gas
217	Hulse & Christopher	Dye #1	27-48-32	801	387			137	664	Gas
218	Wallace	Dye #1	27-48-32	807	226			157	650	Dry
219	Hulse & Christopher	Paul Eveleth	27-48-32	794	86			156 E	638 E	Dry
220		Gleisner #1	27-48-32	901	352			245 E	656 E	Gas
221		A. Meyer #2	27-48-32	791	241			130	661	Gas
222		Muglach #1	27-48-32	931	410	44	887	289	642	Gas
223		" #2	27-48-32	964	415	50	914	300	664	Gas
224		" #3	27-48-32	951	27	15	936	268	676	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
226		F. Schwartz #1	27-48-32	925	395	21	904	272	653	Dry
227		" #2	27-48-32	960	404	50	910	297	663	Gas
228		" #3	27-48-32	942	393	27	915	278	664	Gas
229		" #4	27-48-32	940	630	30	910	283	657	Dry
230		Mrs. Thorogood #1	27-48-32	807	240			177	630	Gas
231	Hulse & Christopher	Weber #1	27-48-32	912	540			244	668	Dry
232		" #2	27-48-32	950	395	39	911	280	670	Gas
234	United Brick & Tile Co.	Plant #10	27-48-32	938	375			272	666	Gas
235	" " "	" #11	27-48-32	918	332			244	674	Gas
236	" " "	" #12	27-48-32	788	235			116	672	Gas
237		Barnett #1	28-48-32	949	391	50	899	290	659	Gas
238		Cowden #1	28-48-32	904	350	4 -	900	246	658	Gas
239		" #2	28-48-32	915	363	10	905	254	661	Gas
240		Crane	28-48-32	953	409	65	888	307	646	Gas
241		M. I. Daub #2	28-48-32	931	386	28	903	286	645	Gas
242		Emmanuel #1	28-48-32	943	396½	39	904	291	652	Gas
243		" #2	28-48-32	947	400	46	901	290	657	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
244		Emmanuel #3	28-48-32	943	393½	35	908	283	660	Gas
245		Grogger #1	28-48-32	918	361	18	900	263	655	Gas
246		" #2	28-48-32	940	390	50	890	290	650	Gas
247		" #3	28-48-32	937	392	43	894	289	648	Gas
248		N. Hansen #1	28-48-32	935	399	41	894	290	445	Gas
249		" #2	28-48-32	935	392½	48	887	299	636	Dry
250		" #3	28-48-32	906	366	13	893	261	645	Gas
251		S.E. Jerrard #1	28-48-32	949	395	54	895	294	655	Gas
252		" " #2	28-48-32	954	395½	50	904	293	661	Gas
253		J.H. Kemper Est.#1	28-48-32	952	409	58	894	298	654	Gas
254		G. W. Neumer #1	28-48-32	935	395½	47	888	285	650	Dry
255		M.I. Daub, now H.L.Olmstead #1	28-48-32	954 -	87	53	901 -			Water
256		G.W. Sechrest #5	28-48-32	924	405	49	875	297	627	Dry
257		Shade #1	28-48-32	909	407	39	870	286	623	Dry
258		Siegle #1	28-48-32	941	396	44	897	293	648	Gas
259		" #2	28-48-32	929	385	27	902	274	655	Gas
261		Steffens #1	28-48-32	946	399	44	902	288	658	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
262	Ruff Drilling Co.	Stubbs #1	28-48-32	918	569	14	904	263	655	Gas
263		C.W. Bendrâf #1	29-48-32	985	440	93	892	337	648	Gas
264		" " #2	29-48-32	980	436	82	901	333	650	Gas
265	Cameron, et al	Cora Daboney	29-48-32	1004	456	105	899	354	650	Gas
266		T.B. Kinlen #1	29-48-32	982	421	80	902	329	653	Gas
267		" " #2	29-48-32	956	410			304	652	Gas
268		T.M. Kinlen #1	29-48-32	958	398	52	906	299	659	Gas
269		Barmenter #1	29-48-32	976	428	85	891	333	643	Gas
271	Cooperative Petr. Co.	C.Robinson #1	29-48-32	983	426	85	898	330	653	Gas
272	" "	" #2	29-48-32	978	425			327	651	Gas
273	" " and Ruf Drilling Co.	" #3	29-48-32	993	615	94	899	342	651	Gas
274		G.W. Sechrest #3	29-48-32	943	395	55	888	295	648	Gas
275		" " #4	29-48-32	974	429	97	877	344	630	Gas
276	J.D. Judd & Co.	White #1	29-48-32	994	447	104	890	348	646	Gas
278	" "	" #2	29-48-32	954	404	62	892	308	646	Gas
277	" "	" #3	29-48-32	930	381	39	891	283	647	Gas
279	Cameron, et al	" #4	29-48-32	986	449	105	881	345	641	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
279A	Cameron, et al	White #5	29-48-32	973	428	96	877	343	630	Gas
281		Kemper Estate #1	30-48-32	1035	534	159	876	416	619	Dry
282		F. A. Morris #1	30-48-32	976	441½	100	876	338	638	Gas
283		" " #2	30-48-32	946	345½	49	897	280	666	Gas
284		Ragan #1	30-48-32	1012	459½	126	886	379	633	Gas
285		Ragan #2	30-48-32	1004	484½	138	866	389	615	Gas
286		" #3	30-48-32	1021	466	125	896	375	646	Gas
287		C.E. Tribble #1	30-48-32	975	423	80	895	340	650	Gas
288		" " #2	30-48-32	985	437	88	897	339	646	Gas
289		" " #3	30-48-32	1009	420	110	899	372	637	Gas
291		" " #5	30-48-32	1012	460	105	907	354	658	Gas
291A		J.A. Ervin	32-48-32	961	435	103	858	379	582	Dry
292		C.G. Parmenter #1	33-48-32	935	395	55	880	302	633	Gas
293		" " #2	33-48-32	920	330	37	883	284	636	Dry
296		Chas. Ross	36-48-32	981	532	58	923	302	679	Dry
I 1										
I 2										

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T. 48 - R. 32

Map No. of Loc.	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B. F.	Elev. Top B. F.	Depth Base My. Sta.	Elev. Base My. Sta.	Type of Well
315	J.D. Judd & Son	Cassell #1	4-48-32	964	475	108	856	357	607	Oil
316		Noll #2	7-48-32	911	100					Water
317	Imperial Refining Co.	Service Sta.	8-48-32	976	170	104	872		627 E	Water
318		George Rex	9-48-32	914	368	42	872	245	627	Gas
321	Launeal Dev. Co.	Old Cox Farm #1	16-48-32	960	651	59	901	301	659	Gas
322	" " "	" " " #2	"	993	715	96	897	338	655	Gas
323	" " "	" " " #3	"	960	320	52	908	---	---	Gas
324	" " "	Hilltop Gardens	"	983	435	77	906	320	663	Gas
320		Waight ServieeSta.	16-48-32	981	565	75	906	324	656	Gas
325		J. C. Hasted	17-48-32	869	400	73	796	312	557	Gas
326	Bradford & Francis	Twin to old #2 Sechrest #3	17-48-32	953	555	72	882	310	643	Dry
327	" " "	Duncan	20-48-32	870	510	---	---	224	646	Dry
329	Ruf Drilling Co.	Walkenhorst #3	21-48-32	793	400	---	---	141	652	Dry
330		Mayer	22-48-32	801	379	---	---	141	660	Gas
328	Hulse & Christopher	Schock	22-48-32	806	345	---	---	135	671	Gas
331	Unity Sch. of Christianity	Unity Farm	24-48-32	914	533	29	885	280	634	Gas
335		Victor L. Phillips #1	26-48-32	829	96	---	---	---	----	Dry

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Map No. of Loc.	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B. F.	Elev. Top B. F.	Depth Base My. Sta.	Elev. Base My. Sta.	Type of Well
332		Victor L. Phillips	#2 26-48-32	821	400			178	643	Dry
336		#3	26-48-32	817	265			172	645	Dry
333	Hulse & Christopher	Roth	27-48-32	815	385			157	658	Dry
334	" "	Clifford	35-48-32	833	380			170	663	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
			T.48-R.33							
1		David M. Proctor	7-48-33	1018	736					Dry
2		Drummond #2	8-48-33	975	451	137	838	390	585	Dry
3		Mission Ldry Co.	8-48-33	969	478	140	824	395	574	Gas
4	Nigro Gas Co.	Snyder-Kunkle Lumber Co.	8-48-33	979	728	134	845	396	583	Dry
5	" " "	Nigro #1	8-48-33	944	379	110	834	377	589	Gas
6		Chas. Nigro #3	8-48-33	942	790			381	561	Gas
7		Chas. Nigro #4	8-48-33	940	740	123	817	377	563	Gas
8		Chas. Nigro #5	8-48-33	969	404	139	830	401	568	Gas
9		Frank Wagger	8-48-33	975	419	142	833	404	571	Gas
10	K.C. Park Commission	Swope Park #1	11-48-33	882	447			321	561	Dry
11	" " "	" " #2	11-48-33	872	1125			322	550	Dry
16	Hall, Frazier & Hermon	B. L. Hall	16-48-33	938	690	100	838	371	567	Gas
17		D. Pucker	16-48-33	964	677	125	839	397	567	Gas
18		Fred A. Deickman	17-48-33	970	396	124	846	391	579	Gas
20	A.A. Cameron & E.Hale	Univ. Laundry	18-48-33	995	905	162	833	429	566	Gas
21		White House	18-48-33	948	175	149	799			Water

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
22		Harry E. Smith #1	20-48-33	917	351	90	827	349	568	Dry
23		" " " #2	20-48-33	917	605	90	827	350	567	Dry
24	Ruf Drilling Co.	Chas. C. Allen	21-48-33	785	325			196	589	Dry
25		Donald	21-48-33	879	338	42	837	319	560	Dry
26		Heltz	21-48-33	783	523			215	568	Dry
27	M. T. Drilling Co.	Hill #1	22-48-33	910	360	44	866	303	607	Gas
28	Ruf Drilling Co.	Maggie O'Reilly	22-48-33	792	195			191	601	Gas
29		Bassler	23-48-33	864	116	22	842			Water
31		Hopkins	25-48-33	939	450	105	834	366	573	Dry
32		Excelsior Powder Co	2 6-48-33	879	580	61	818	323	556	Dry
33		A. J. King #1	27-48-33	923	505	72	851	329	594	Gas
34		Martin Welch	27-48-33	881	376	41	840	311	571	Dry
35	Dr. H. H. Francis	Butler Old Speedway #1	28-48-33	799	570			181	618	Gas
36	" "	" " #2	28-48-33	798	207			195	607	Gas
37	" "	" " #3	28-48-33	800	218			206	594	Gas
38	" "	" " #5	28-48-33	798	241			200	598	Dry
40	" "	" " #7	28-48-33	799	203			198	601	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
41	Dr. H. H. Francis	Butler Old Speedway #8	28-48-33	799	201			198	601	Gas
43		Gibbs	29-48-33	893	610	88	805	363	530	Dry
44	Haysler & Son	Haysler	31-48-33	928	377⅛	110	818	375	553	Dry
54		Richard Miller	32-48-33	864	565	50	814	312	552	Dry
45	J. M. Horner	Scholler	32-48-33	790	420			255	535	Dry
46		Strauss	32-48-33	827	590			294	533	Dry
47	Marshall & Bartle	E.C. Arn	33-48-33	804				220	584	Dry
48		Abernathy #1	34-48-33	970	397	131	839	387	583	Gas
49		" #2	34-48-33	973	705	127	846	379	594	Gas
50		" #3	34-48-33	965	406	123	842	383	582	Dry
51	Russel et al	Bannister #1	36-48-33	1029	1820	174	855	430	599	Dry
53		T. T. Moore	36-48-33	1009	520	174	835	430	579	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
			T.49-R.29							
1	J. N. Guy Oil Co.	John Steinhauser	6-49-29	932	2465			240	692	Dry
2		J. C. Guy	9-49-29	765	2276			67	698	Dry
4		James N. Guy	32-49-29	880				138	742	Dry
J.			T.49-R.30							
1		Bernice Banker	2-49-30	903	186					Water
2		Sherrill	7-49-30	926	527	27	899	273	653	Dry
5		Lowe	21-49-30	940	668½	40	900	282	658	Dry
6	Mo.-Kan. Pipe Line Co.	Y. E. Davis	29-49-30	874	485			234	640	Dry
7	" " " " "	M. T. Scott	31-49-30	921	556	50	871	293	628	Dry
8		Adams Dairy	32-49-30	930	696	48	882	292	638	Dry
9		McClintock	32-49-30	919	400	43	876	286	633	Dry
K			T.49-R.31							
1		R.R. Redfield	1-49-31	916	220	28	888			Water
2	J.M. & F.P. Stucker	J.A. Koehler #1	2-49-31	744	382			97	647	Dry
3	White & Moore	T. L. Krenshaw	3-49-31	749	703			100	649	Dry
4		Mark Salisbury #2	5-49-31	822	252			196	626	Dry

T. 49 - R. 29

[illegible]a Map No. of [illegible]c..	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B. F.	Elev. Tpp B. F.	Depth Base My. Sta.	Elev. Base My. Sta.	Type of Well
3		O. S. Mathes	30-49-29	902	160			111	791	Water
5		R. D. Bleich	32-49-29	826	240			45	781	Water
6		Chas. Steele	7-49-29	822	180			136	686	Water

Addenda
T. 49 - R. 30

Map No. of Loc.	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B. F.	Elev. Top B. F.	Depth Base My. Sta.	Elev. Base My. Sta.	Type of Well
14		O. H. Smith	3-49-30	917	185	14	903	---	657 E	Water
12		Lou Roger Jones	4-49-30	923	200	17	906	---	660 E	Water
13		Armstrong	25-49-30	785	273	---	---	97	688	Water
10		Brakebill	25-49-30	798	140	---	---	95	703	Water
11		Grain Valley Sch.	35-49-30	815	300	---	---	151	664	Water

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
5		Mark Salisbury #1	6-49-31	799	300			170	629	Dry
6	D. S. Hulse	Dr. Williams	6-49-31	825	490			195	630	Dry
8	Mo. Valley G. & O. Co.	F. W. Brown	9-49-31	868	400			237	631	Dry
9	Morton J. White	Teeters	9-49-31	786	1500			138	648	Dry
12	J.M. & F.P. Stucker	Bruner	11-49-31	840	350					Dry
13	" " "	Bowman	12-49-31	838	345			174	664	Dry
14	Louis Knoche	L. S. Lowe	14-49-31	906	465	1	905	258	648	Dry
15		H. B. Main	15-49-31	889	500	10	879			Dry
17		C. E. McBride #1	22-49-31	890	495	21	869	260	630	Dry
18		C. E. McBride #2	22-49-31	874	80	12	862			Dry
20		C. E. McBride #4	22-49-31	905	63	34	871			Dry
21		E. Carel	23-49-31	912	522	27	885			Dry
37		Mitchell Henderson #1	23-49-31	925	675	38	887	294	631	Dry
22		Wagner	23-49-31	922	250	26	896			Water
23		Tom Bash #1	26-49-31	895	110	21	874			Water
24		Tom Bash #2	26-49-31	912	301	26	886			Dry
25		Mitchell Henderson #1	26-49-31	918	125	33	885			Water.

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
26		Tom Bash #1	27-49-31	877	500	24	853	265	612	Aband. Gas
27		Mitchell Henderson #1	27-49-31	878	250	26	852			Water
36		" " #2	27-49-31	874	650	23	851	257	617	Dry
29		Dr. Johnson	27-49-31	866	230	27	839			Water
34	Dr. Francis - Eiken	Casey #1	31-49-31	777	480			173	604	Dry
35	Dr. Francis	Scott #1	31-49-31	773	547			180	593	Dry
30	Mo.-Kan. Pipe Line Co.	Kate Conboy	32-49-31	887	500	18	869	260	627	Dry
31		Eldridge	32-49-31	784	410			153	631	Dry
32		Dr. A. W. Thompson	33-49-31	886	230	21	865			Water
33		A. Carmichael	34-49-31	900	535	35	865			Dry

Addenda
T. 49 - R. 31

Map No. of Loc.	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B. F.	Elev. Top B. F.	Depth Base My. Sta.	Elev. Base My. Sta.	Type of Well
38		Mrs. J. F. Curr	4-49-31	784	156	---	---	139	645	Water
41		Gail Berry	5-49-31	794	100	---	---	---	---	Water
42	Mel Pallette	Kelley	5-49-31	791	482			163	628	Dry
39	Hulse & Christopher	Lester Haas	18-49-31	918	541	49	869	295	623	Dry
40		Mrs. Wagner	23-49-31	915	186	40	875	---	630 E	Water
44	Ruf Drg. Co.	Mitchell Henderson #1	27-49-31	859	90	10	849			
45	" " "	" " #2	27-49-31	878	350	26	852	252	626	Dry
46	Hammel & Gatton	Hall	30-49-31	824				226	598	Dry

Here

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
			T.49-R.32							
1	Schloeman & Hulse	Baird	1-49-32	859	558	7	852	245	614	Aband. Gas
2	E. C. Hamilton	Fee	1-49-32	1021	474	165	856	400	621	Aband. Gas
3	Schloeman & Hulse	Harvey #1	1-49-32	893	193	37	856			Aband. Gas
4	Schloeman & Hulse	Harvey #2	1-49-32	882	180	26	856			Aband. Gas
5	D. S. Hulse	Holliway	1-49-32	862	345	6	856	249	613	Dry
6	Hessert & Hulse	Lebi	1-49-32	911	415	60	851	300	611	Aband. Gas
8	S. Hulse	W. Ressler	1-49-32	922	228	76	846			Dry
13		King	2-49-32	1036	842	238	798	446	590	Aband. Gas
15	Ammon White	Ammond White	3-49-32	980	448	143	837	385	600	Aband. Gas
16	F. L. Byam	Byam Theater	4-49-32	850	327			292	558	Water
18	Davis & Bradford	Hendley #1	5-49-32	846	72	33	813			Dry
19	Dr. J. P. Kanoky	Fee #1	5-49-32	856	693			276	580	Aband. Gas
20	Dr. J. P. Kanoky	" #2	5-49-32	863	451	40	823	295	568	Aband. Gas
21	Dr. J. P. Kanoky	" #4	5-49-32	830	368			288	542	Dry
22	Lewis Automobile Serv.	Fee	5-49-32	841	410	54	787	320	521	Dry
23	J. E. Douglas	Sawyer	5-49-32	776	303			210	566	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
24	American Asphalt Roof Co.	Fee #2	6-49-32	749	483			175	574	Aband. Gas
25	" " "	Fee #3	6-49-32	752	530			176	576	Aband. Gas
26	" " "	Fee #4	6-49-32	742	430			173	569	Aband. Gas
27	Black, Swalls,&Bryson	Fee #1	6-49-32	738	395			180	558	Dry
28	Butler Mfg. Co.	7400 E. 13th K.C.	6-49-32	761	480			191	570	Aband. Gas
29	Guinotte	Fee #1	6-49-32	737	455			237	500	Aband. Gas
30	J.D. Judd, et al	Guinotte Stark Acres #1	6-49-32	737	404			163	574	Aband. Gas
31	"	" #2	6-49-32	760	414			210	550	Aband. Gas
32	"	" #3	6-49-32	751	430			185	566	Dry
33	"	" #4	6-49-32	769	455			216	553	Dry
34	"	" #5	6-49-32	753	414			200	553	Aband. Gas
35	"	" #6	6-49-32	741	399			180	561	Aband. Gas
36	Prior Brass Co.	Fee #1	6-49-32	741	300					Aband. Gas
37	" " "	" #2	6-49-32	739	438			177	562	Aband. Gas
38	Security Stove Co.	Fee #1	6-49-32	756	424½			187	569	Aband. Gas
39	Barton & Fort	Whitney #1	6-49-32	739	410			175	564	Aband. Gas
40	" "	" #2	6-49-32	744	445			176	568	Aband. Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
41	Wittee Engine Works	#1	6-49-32		292					Aband. Gas
42	" " "	#2	6-49-32	750	304			214	536	Aband. Gas
43	" " "	#3	6-49-32	756	465			185	571	Aband. Gas
44	M. T. Drilling Co.	A. P. Nichols #1	7-49-32	754	417½			197	557	Aband. Gas
45	" "	" " #2	7-49-32	747	417			190	557	Aband. Gas
46	" "	" " #3	7-49-32	752	435			206	546	Aband. Gas
47	F. E. Davis	Ott #1	7-49-32	876	565	72	804	324	552	Dry
48	" "	" #2	7-49-32	924	654	120	804	368	556	Dry
49	Smith	Fee	7-49-32	854	187	60	794			Water
192	Southard Feed Co.	Fee	7-49-32	742	460			176	566	Aband. Gas
50	Union Wire Rope Co.	Fee #1	7-49-32	751	472			192	559	Aband. Gas
51	" " " "	" #2	7-49-32	751	435			186	565	Aband. Gas
52	" " " "	" #3	7-49-32	752	659			187	565	Aband. Gas
53	" " " "	" #4	7-49-32	738	406			172	566	Aband. Gas
54	" " " "	" #5	7-49-32	749	412			185	564	Aband. Gas
55	" " " "	" #6	7-49-32	739	446			180	559	Aband. Gas
56	J. E. Douglas	Kibby #1	8-49-32	893	389	72	821	320	573	Aband. Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
57	F. E. Davis	Kline #1	8-49-32	870	381	46	824	295	575	Aband. Gas
59	" "	" #2	8-49-32	924	561½	110	814	352	572	Aband. Gas
60	" "	" #3	8-49-32	853	620	33	820	277	576	Aband. Gas
61	Schloeman & Hulse	Pratt #1	8-49-32	928	450	118	810	357	571	Dry
62	F. E. Davis	Showen	8-49-32	842	369	21	821	269	573	Aband. Gas
63	F. E. Davis, et al	Swathford	8-49-32	879	398	71	808	320	559	Dry
64	F. E. Davis, et al	Jim White	8-49-32	923	445	109	814	364	559	Dry
67	Mo. Valley Gas & Oil Co.	Cavanaugh #1	9-49-32	823	565			215	608	Aband. Gas
68	" " " "	Hunter #1	9-49-32	834	334	10	824	237	597	Aband. Gas
69	McCormick & Martin	Martin	9-49-32	910	460					Aband. Gas
70	Mo. Valley Gas&Oil Co.	Perdue #1	9-49-32	848	370	24	824	272	576	Dry
71	" " "	Rock Creek School #1	9-49-32	868	81½	39	829			Aband.
73	Homer Vaughan	Englewood Mkt #1	9-49-32	919	407	95	824	340	579	
235	" "	" " #2	9-49-32	919	540	95	824	342	577	Dry
74	J. I. Curtis	Fee	10-49-32	970	628	127	843	368	602	Dry
75	Lou Holland	Fee #2	10-49-32	934	580	100	834	336	598	Aband. Gas
76	Lee Hart	Fee	11-49-32	1009	235	178	831			Water

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
7	Schloeman & Hulse	Preator	12-49-32	914	225	60	854			Dry
244	C. Hammil	Dennis #1	15-49-32	874	492	38½	836	278	596	Dry
78		J.W. Pemblott	15-49-32	930	425	105	825	350	580	Dry
191	Bradford & Francis	Baldry #1	16-49-32	944	540	109	835	360	584	Aband. Gas
232	Bradford & Davis Bros.	Cannell	16-49-32	961	572	115	846	354	607	Aband. Gas
80	Douglas & E.E.Place	Carr #1	16-49-32	906	545	75	831	320	586	Dry
81	Bradford & Carr	Carr #1	16-49-32	951	560	109	842	356	595	Aband. Gas
236	B. I. Hall	H. S. Crow #1	16-49-32	940	573	120	840	364	596	Aband. Gas
83	Mo.Valley Gas & Oil Co.	Geo. H.Flannagan	16-49-32	885	500	35	850	275	610	Dry
84	Bradford & Davis Bros.	" " #1	16-49-32	914	448	78	836	327	587	Dry
85	Mo.Valley Oil & Gas. Co.	Franklin Orchard #1	16-49-32	975	469	130	845	379	596	Aband. Gas
86	" " " "	" " #3	16-49-32	980	600	138	842	376	604	Dry
82		Gray	16-49-32	939	150	106	833			Water
87	Mo.Valley Gas & Oil Co.	Zella Hartman	16-49-32	916	82	82	834			Aband.
245	Hall & Baldwin	Kelley #1	16-49-32	940	550	101	839	320	620	Aband. Gas
204	Mo.Valley Gas & OilCo.	Kella #1	16-49-32	951	580	129	822	367	584	Dry
88	" " " "	Geo. Logan #1	16-49-32	943	404	83	860	315	628	Aband. Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
195	Mo.Valley Oil&Gas Co.	Geo. Logan #2	16-49-32	942	449	79	863	310	632	Aband. Gas
89	Campbell Bradford,Davis Bros.	Luther #1	16-49-32	938	430	87	851	326	612	Aband. Gas
194	" "	" #2	16-49-32	951	563	104	847	348	603	Aband. Gas
90	Mo.Valley Oil&Gas Co.	Noland #1	16-49-32	926	535	81	845	327	599	Dry
200	" "	Perdue #2	16-49-32	880	531	55	825	307	543	Dry
92	" "	Simpson Realty Co.	16-49-32	916	400	87	829	334	582	Dry
93	Bradford & Francis	Withar #2	16-49-32	998	650	172	826	420	578	Dry
94	Mo.Valley Gas & OilCo.	C.H. Withar #1	16-49-32	981	545	127	854	369	612	Aband. Gas
96	" " "	" " #2	16-49-32	978	580	123	855	367	611	Aband. Gas
97	Hulse & Christopher	Young #1	16-49-32	928	316	101	827			Dry
98	D. S. Hulse	Betts #1	17-49-32	995	485½	158	837	399	596	Aband. Gas
99	D. S. Hulse	Betts #2	17-49-32	969	450	128	841	366	603	Aband. Gas
100	D. S. Hulse	Betts #3	17-49-32	963	579	126	837	357	606	Aband. Gas
101	D. S. Hulse	Coldsnow	17-49-32	1011	515	175	836	415	596	Dry
102	Davis, Bartle&Hulse	J. A. Denton #1	17-49-32	1007	652	188	829	429	578	Dry
103	Mo.Valley Gas & OilCo.	Fogle #1	17-49-32	881	375	45	836	284	597	Aband. Gas
104	" "	" #2	17-49-32	960	443	121	839	358	602	Aband. Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
105	Mo.Valley Gas& Oil Co.	Fogle #3	17-49-32	958	615	119	839	362	596	Abans. Gas
106	Hulse,Christopher,Bradford	Mrs. Peggy Green	17-49-32	937	155	115	823			Dry
107	Hulse & Christopher	A. G. Haugas	17-49-32	1006	628½	166	840	399	607	Aband. Gas
108	D. S. Hulse	Emma Loemiller	17-49-32	914	395	84	830	323	591	Dry
109	F. E. Davis	Angels Marott#1	17-49-32	1004	479			395	608	Aband. Gas
110	Bradford & Francis	Read #1	17-49-32	956	574	124	832	366	590	Aband. Gas
112	D. S. Hulse	J.C. Schoener#1	17-49-32	962	450	122	840	368	594	Aband. Gas
113	Bradford, Christopher & Hulse and	" " #2	17-49-32	960	405	128	832	376	584	Aband. Gas
113A	Hulse and Christopher	Wilson #1 Mrs. Martha	17-49-32	945	562	103	842	337	608	Aband. Gas
114	" " "	" " #2	17-49-32	946	334	105	841			Aband. Gas
115	" " "	" " #3	17-49-32	906	735	70	836	311	595	Aband. Gas
116	F. E. Davis	Wilson Hrs. #1	17-49-32	976	466½	130	846	370	608	Aband. Gas
117	" "	" " #2	17-49-32	930	425	89	841	326	604	Aband. Gas
118	Mo.Valley Gas & OilCo.	" " #3	17-49-32	957	600	119	838	356	601	Aband. Gas
119	" " "	Wm. Wilson #1	17-49-32	934	539	94	840	331	603	Aband. Gas
120	" " "	" " #2	17-49-32	935	326	96	839			Aband. Gas
121	" " "	P.B. Wilson #1	17-49-32	943	440	110	833	353	590	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
122	Mo. Valley Gas&Oil Co.	P.B. Wilson #2	17-49-32	977	654	147	830	390	587	Dry
123	Bradford & Francis	C.H. Withar #1	17-49-32	990	625	167	823	421	569	Aband. Gas
124	Mo. Valley Gas&Oil Co.	Woodson #1	17-49-32	974	455	131	843	361	613	Aband. Gas
125	" " "	" #2	17-49-32	984	596	141	843	383	601	Aband. Gas
126	" " "	Callenger #1	18-49-32	872	498	42	830	284	588	Aband. Gas
126A	W. J. Dalton	Fee	18-49-32	892	111	66	826			Dry
127	Charles Guinn	Fee	18-49-32	943	445	110	833	350	593	Aband. Gas
128	Hulse-Christopher-Bradford	McClellan #1	18-49-32	846	505	21	825	275 + -	571 + -	Dry
129	" " "	Munsell #1	18-49-32	917	540	94	823	339	578	Aband. Gas
130	" " "	" #2	18-49-32	941	560	110	831	354	587	Aband. Gas
131	Mo.Valley Gas & Oil Co.	Rummell & Miles #1	18-49-32	909	545	72	837	310	599	Dry
132		Lewis DDH #3	20-49-32	923	969	109	814	362	561	Dry
133	Mo.Valley Gas& Oil Co.	Franklin Orchard #2	21-49-32	971	450	125	840	371	600	Aband. Gas
133A		Rupert & Mathis	21-49-32	1004	532	182	822	416	588	Dry
201	Bradford & Francis	Schowengerdt #1	21-49-32	1015		186	829	433	582	Dry
243	Dr. Francis	" #2	21-49-32	1031	645	201	830	448	583	Dry
135	Mo. Valley Gas & Oil Co.	Fred Withar #2	21-49-32	1009		169	840	413	596	Aband. Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
209	Bradford & Francis	Fred Withar #1	21-49-32	983	587	146	837	396	587	Aband. Gas
221	Hulse & Christopher	D. Arends	22-49-32	1057	637	205	852	452	605	Aband. Gas
220	B. I. Hall	J. Arends	22-49-32	1036	661	182	854	424	612	Dry
228	Earl Smith	Carr #1	22-49-32	1055	639	204	851	450	605	Aband. Gas
136	Mo. Valley Gas & Oil Co.	Jim Cathcart	22-49-32	1035	680	195	840	438	597	Dry Water
137	" " " "	Chas Hill	22-49-32	1039	243	205	834			Dry
214	" " " "	Kirby	22-49-32	1004	199	158	846			Dry
203	" " " "	Larson #1	22-49-32	1051	618	200	851	437	614	Aband. Gas
229	" " " "	Larson #2	22-49-32	1043	629	193	850	438	605	Aband. Gas
224	" " " "	Locke (Davis) (Royalty)	22-49-32	1043	617	189	854	431	612	Aband. Gas
138	F. E. Davis	Fred Redford #1	22-49-32	937	611	103	834	339	598	Dry
233	Hulse & Christopher	Fred Redford #1	22-49-32	1014	615	170	844	414	600	Dry
240	" "	" " #2	22-49-32	1006	623	164	842	401	605	Dry
231		Simmons Cottage Camp	22-49-32	1052	631	204	848	444	608	Aband. Gas
212	Mo. Valley Gas & Oil Co.	Smith #1	22-49-32	1012	591	165	847	407	605	Aband. Gas
241	Hulse & Christopher	" #1	22-49-32	1021	183	183	838			Dry
246	" "	" #2	22-49-32	970	570	135	835	372	598	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
237	Hulse & Christopher	Stone 1A	22-49-32	1024	620	181	843	426	598	Aband. Gas
215	" "	Wagner	22-49-32	1024	635	172	852	418	606	Aband. Gas
207	" "	Williamson & Weston #1	22-49-32	1038	611	185	853	425	613	Aband. Gas
247	" "	" " #2	22-49-32	1038	497	183	855	423	615	Aband. Gas
249	" "	" " #3	22-49-32	1028	614	173	855	414	614	
234	Hall & Gatton	Witte #1	22-49-32	1021	609	179	842	420	601	Aband. Gas
239	" "	" #2	22-49-32	1010	605	174	836	412	598	Aband. Gas
248	" "	" #3	22-49-32	987	595	146	841	386½	601	Dry
250	" "	" #4	22-49-32	975	595	146	841			?
140		L.B. Schowengerdt	23-49-32	1040	493	214	826	458	592	Dry
141		Patterson	23-49-32	943	85	134 E	809 E			Water
197	Hulse & Christopher	Cook #1	27-49-32	1038	594	173	863	418	618	Aband. Gas
237	Mo. Valley Gas & Oil Co.	Howe #1	27-49-32	992	574	133	859	375	617	Aband. Gas
198		Sam Kaplon	27-49-32	980	171	124	856			Water
230	Hulse & Christopher	Julian and Emma Lebricht	27-49-32	997	574	136	861	380	617	Aband. Gas
142	Mo. Valley Gas & OilCo.	Melcher	27-49-32	976	549	112	864	357	619	Aband. Gas
145	" " " "	Norfleet #1	27-49-32	1008	577	144	864	384	624	Aband. Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
208	Mo. Valley Gas &OilCo.	Norfleet #2	27-49-32	1029	589	169	860	412	617	Aband. Gas
226	Ruf Drilling Co.	W.W. Robinson	27-49-32	974	536	110	864	348	626	Aband. Gas
227	Hulse & Christopher	Walter Schulenberg	27-49-32	1037	608	171	866	418	619	Aband. Gas
150	J. D. Judd & Co.	Sni-A-Bar Gardens #1	27-49-32	1039	665	193	846	449	590	Dry
151	Johnson	" " #2	27-49-32	985	540	120	865	361	624	Aband. Gas
219	Mo.V. G&O. Co.-Johnson	" " #1	27-49-32	971	540	104	867	346	625	Aband. Gas
149		Summe Dairy #3	27-49-32	959	352	100	859	339	620	Aband. Gas
152	Mo. ValleyGas&Oil Co.	Twichers #1	27-49-32	959	644	103	856	348	611	Dry
154	Hulse & Christopher	Ware #1	27-49-32	1032	595	177	855	419	613	Aband. Gas
158	Dutch Mill Filling Sta.	Tourist Camp	29-49-32	800	310½			223	577	Dry
159	A. A. Gillespie	Fee #1	29-49-32	900	187	48	852			Dry
160	" "	" #2	29-49-32	895	268	35	860			Aband. Gas
162	J. D. Judd & Co.	Dr. Lane #1	29-49-32	853	500	0	853	247	606	Aband. Gas
163	Gentry	Fee #1	30-49-32	764	540			190	574	Aband. Gas
164	A. B. Grogger	Fee #1	30-49-32	832	450	3	829	248	584	Dry
165	A. B. Grogger	Fee #2	30-49-32	784				205	579	Dry
166	Kansas City, Mo.	House of Correction Municipal Farm	30-49-32	766	508			166	600	Aband. Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
167		F. E. Lane #2	30-49-32	925	560	66	859	317	608	Aband. Gas
168		Wilson #1	30-49-32	893	550	77	816	297	596	Dry
169	Mo.-Kan. Gas Co.	Winters #1	30-49-32	936	440	104	832	348	588	Dry
170	H. T. Grubbs	Fee #1	32-49-32	869	365	26	843	280	589	Dry
171	Barton & Plakas	Plakas #1	32-49-32	891	400	39	852	271	620	Aband. Gas
172	Pete & Lena Plakas	Plakas #1	32-49-32	888	371	39	848	318	570	Aband. Gas
174	W. K. Buxton	Fee #1	33-49-32	1012	481	152	860	395	617	Aband. Gas
175	Earl C. Gardner	Fee #1	33-49-32	1007	475	152	855	393	614	Dry
178	Henthorn	Fee	33-49-32	980	160	112	868			Water
180	Mo.-Kan. Pipe Line Co.	Mary B. Lewis	33-49-32	981	485	121	860	370	611	Dry
181	Scafe Drilling Co.	Fee #1	33-49-32	1007	478	152	855	400	607	Aband. Gas
183	Mo.V. G&O.Co.-Bradford	J. E. Snoddy	33-49-32	999	593	131	868	376	623	Dry
203	Ruf Drilling Co.	Ray A. Depew	34-49-32	891	525	19	872	266	625	Dry
222	" " "	Glen Lake Fishing Club	34-49-32	922	515	49	873	300	622	Dry
199	" " "	Jackson	34-49-32	1008	647	157	851	403	605	Dry
218	" " "	T.J. Kelley #2	34-49-32	932	512	62	870	310	622	Aband. Gas
186	Mo.Valley G. & O. Co.	Pendleton #1	34-49-32	941	547	80	861	319	622	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
223	Ruf Drilling Co.	Deborah Pendleton	34-49-32	969	550	103	866	347	622	Aband. Gas
217	" " "	L. Thurman	34-49-32	952	515	80	872	325	627	Aband. Gas
225	" " "	Elanora Whitney	34-49-32	964	547	98	866	346	618	Aband. Gas
188		Brady	35-49-32	925	473	48	877	286	639	Aband. Gas
205	Ruf Drilling Co.	Chauncey #1	35-49-32	823	390			190	633	Aband. Gas
210	" # "	Dr. Davis	35-49-32	834	385			180	654	Aband. Gas
189		Dr. E.A. Eubanks	35-49-32	915	503	33	882	277	638	Aband. Gas
216	RufDrg.Co. ½ Eubanks ½	Dr. Eubanks	35-49-32	884	475	6	878	234	650	Dry
213	Ruf Drilling Co.	T. B. Hensley	35-49-32	833				193	640	Aband. Gas
211	" " "	T.J. Kelley #1	35-49-32	834	395			206	627	Aband. Gas
190	" " "	Orlando Twiehaus	35-49-32	973	605	107	866	356	617	Dry
M1										
M2										
M3										

Addenda
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Map No. of Well	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B.F.	Elev. Top B. F.	Depth Base My.Sta.	Elev. Base My.Sta.	Type of Well
274		Singleton	2-49-32	978	546	145	833	391	587	Dry
281	Bradford& Campbell	Trantos	8-49-32	898	571	81	817	337	567	Dry
263		Dr. S. L. Green	10-49-32	1006	624	180	826	420	586	Dry
266		C. Bradbrook	15-49-32	927	125	37	890	---	---	Water
259	Hulse & Christopher	Indep. Land & Dev. #1	15-49-32	882	465	---	---	Old hole	deepened	Gas
260	" "	" " #2	15-49-32	900	470	51	849	287	613	Gas
258	Ruf Drilling Co.	Oldham	15-49-32	987	590	147	840	393	594	Dry
256	B. I. Hall	Witte #5	15-49-32	934	530	88	846	332	602	Dry
257	" "	" #6	" "	943	542	98	845	344	599	Dry
270	Ruf Drilling Co.	Mrs. Ida Witte	15-49-32	946	555	109	837	351	595	Dry
267	B. I. Hall	Cassel	16-49-32	937	555	106	831	352	585	Dry
262	Hammel & Gatton	Geo. Gerhart	16-49-32	942	525	99	843	343	599	Gas
261	B. I. Hall	Hartman	16-49-32	950	576	103	847	334	616	Dry
282	Bradford & Son	Munsell #4	18-49-32	892	610	120	772	364	528	Gas
283		Gentry	20-49-32	904	335	83	821	329	575	Dry
251	Bradford & Francis	Brauninger	21-49-32	1025	795	190	835	443	582	Dry
252	" " "	Hawkinson	21-49-32	990	645	155	835	402	588	Dry

Map No. of well	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B.F.	Elev. Top B. F.	Depth Base My.Sta.	Elev. Base My.Sta.	Type of Well
265	Mo. Valley Gas & Oil	Co. Hawkinson	21-49-32	996	645	161	835	409	587	Dry
275		Wellborn	21-49-32	990	185	157	833	---	588 E	Water
276		Buehler	22-49-32	1017	624	175	842	420	597	Dry
284	Hulse & Christopher	Wiston	22-49-32	1015	500	169	846	414	601	Dry
268	B. F. Hammel	Cruwell #1	24-49-32	924	511	77	847	323	601	Dry
269	" "	" #2	24-49-32	948	107	---	---	---	---	Dry
290		Riss	28-49-32	988	489	169	819	419	569	Dry
271	Bradford & Son	Laura Lane	30-49-32	903	390	36	867	281	622	Gas
278	" " "	Letha Lane #4	30-49-32	940	415	75	865	320	620	Gas
277	Bradford & Francis	Floyd R. Smith	30-49-32	948	430	95	853	335	613	Gas
279		Wilson #2	30-49-32	898	293	57	841	---	---	Gas
253	Bradford & Son	Pitcher	30-49-32	920	405	51	869	298	622	Gas
285	Bradford & Francis	Smith #1	31-49-32	964	450	106	858	352	612	Gas
286	" " "	Thrasher	31-49-32	982	600	131	851	375	607	Gas
254	" " "	Whitaker #1	31-49-32	921	540	60	861	307	614	Dry
255	" " "	" #2	31-49-32	958	435	96	862	342	616	Gas
272	Dr. Francis	H. E. Wolfe	31-49-32	1008	491	156	852	406	602	Gas

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Map No. of Well	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B.F.	Elev. Top B. F.	Depth Base My.Sta.	Elev. Base My.Sta.	Type of Well
287	H. H. Francis	Letha Lane #1	32-49-32	838	430	---	---	242	596	Gas
288	" "	" " #2	" "	863	335	---	---	264	599	Gas
289	" "	" " #3	" "	863	220	---	---	---	---	Dry
291	Bradford et al	Lutz	33-49-32	988	642	127	861	372	616	Dry
264	Breuer	S. L. Conway	35-49-32	844	460	---	---	236	608	Dry
273	Thompson & Breuer	O. H. Thompson	35-49-32	919	475	18	901	284	635	Dry

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Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
			T.49-R33							
1		Weber Engine Co. #1	1-49-33	772	502			224	548	Dry
2		" " #2	1-49-33	751	468			207	544	Dry
5		Enoch Butcher #1	2-49-33	862	400	75	787	324	538	Dry
6		" " #2	2-49-33	861	530	36	785	325	536	Dry
7		American Sash & Door Co.	3-49-33	844	675	90	754	340	504	Dry
8		J. C. Estes	3-49-33	844	432	72	772	319	525	Dry
14		Ed. Wax	3-49-33	958	675	201	757	454	504	Dry
16		Zanner Apts.	3-49-33	936	710	180	756	430	506	Dry
17		Clark Paving Co.	4-49-33	930	760	164	766	424 E	506	Dry
18		Faultless Laundry	4-49-33	852	600	97	755	353	499	Dry
19		Ideal Laundry	4-49-33	848	704	87	761	329	519	Dry
20		Neuer Bros. Meat Co.	4-49-33	912	715	170	742	413	499	Dry
21		Union Ice Co.	4-49-33	943	400	203	740	460 E	483 E	Dry
22		Unity School of Christianity	4-49-33	935	1997	191	744	441	494	Dry
23		Dunlap Laundry	5-49-33	934	729	205	729	495	439	Dry
24		Franklin Ice Cream Co.	5-49-33	904	826	164	740	414	490	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
25		St. James Hotel	5-49-33	827	527	67	760	363	464	Dry
27		Blanchard	6-49-33	747	620			307	440	Dry
30		Columbia Steel Tank Co. #3	6-49-33	746	362			312	434	Dry
36		J. N. Dietz	7-49-33	920	601	158	762	435	485	Gas
44		Geo. Muehlbach Brewing Co.	8-49-33	818	866	82	736	357	461	Dry
45		Dr. Phillips	8-49-33	959	692	191	768	465	494	Dry
46		Shukert	8-49-33	874	603½	129	745	397	477	Dry
47		Dr. Slusher	8-49-33	951	690	184	767	463	488	Dry
48		Nicollet Apts.	9-49-33	948	330	168	780			Dry
49		Dr. I. M. Ridge	9-49-33	885	436	123	762	398	487	Dry
50		Nat'l. Tie Co. #3	13-49-33		322					Gas
51		" " " #4	13-49-33	764	301	2		217	547	Gas
52	G. F. Green	Bryon Hotel	15-49-33	995	685	215	780	479	520	Aband. Gas
53		Dragon Cleaners	15-49-33	938	630	144	794	394	544	Dry
54	Harry Goldberg	Commodore Hotel	16-49-33	986	753	224	762	483 E	503 E	Dry
55		Beaumont Apts.	17-49-33	983	541	230	753	498	485	Dry
56	M.L. McLaughlin	A. Schultz Criterion Cleaners	17-49-33	971	138	235	736	500	471	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
59		Simon-Wiles Mtr.Co.	17-49-33	902	770	155	747	425	477	Dry
60		Battenfield Grease Co.	18-49-33	793	523	34	759	297	486	Aband. Gas
61		K. C. Marble & Tile Co. #1	18-49-33	753	683			255	498	Gas
62		" #2	18-49-33	753 + -	311			245 + -	508 + -	Gas
63		Midwest Precote Co. #1	18-49-33	753	245			238	515	Gas
64		" #2	18-49-33	751	498			236	515	Gas
65		Nat'l. Mfg. Co.	18-49-33	752	650			231	521	Gas
66		Rodney Mills Co. #1	18-49-33	760	494			233	527	Gas
68		Goar	19-49-33	964	453	191	773	448	516	Dry
69		Drum	20-49-33	898	609	146	752	412	486	Dry
70	Southwest Drug Co.	Kirk & Bechtel	20-49-33	935	595	191	744	471	464	Dry
72		Westport Laundry Co.	20-49-33	936	675	181	755	448	488	Dry
73		Ruf Bros.	21-49-33	919	715	140	779	413	506	Dry
74		Oak Park Laundry	22-49-33	872	804	96	776	355	517	Dry
75		Woods	22-49-33	924	792	141	783	399	525	Dry
77		Hannah Drug Co.	24-49-33	788	480			240	548	Dry
78		Krakenfuhl	24-49-33	759	575			229	530	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
79		A. Reich & Son #1	24-49-33	783	350			239	544	Gas
80		" " " #2	24-49-33	775	288			237	538	Gas
81		Grover Renick #1	24-49-33	773	287			222	551	Gas
82		" " #2	24-49-33	773	281			217	556	Gas
83		" " #3	24-49-33	768	285			215	553	Gas
84		Nat'l. Tie Co. #1	24-49-33	775	345			212	563	Gas
85		" " " #5	24-49-33	769	270			200	569	Dry
86		Heffner	26-49-33		234					
88		Home Rug and Curtain Co.	28-49-33	810	584	32	778	310	500	Dry
89		M. Cells Co.	29-49-33	829	615	61	768			Dry
90		Gumfliano	29-49-33	828	630	62	766	335	493	Dry
91		Kelley	29-49-33	869	635	99	770	368	501	Dry
93	W. L. Meyers, et al	W. J. Jenkins	30-49-33	864	840	73	791	345	519	Dry
94		Mrs. Everett	31-49-33	941	711	150	791	402	539	Gas
95		Franklin	31-49-33	965	515	160	805	414	551	Dry
96		J.R. Battenfield	32-49-33	896	702	110	786	381	515	Dry
97		Country Club Dairy	32-49-33	935	403	137	798	398	537	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
98		W. S. Dickey #1	32-49-33	919	437	118	801	375	544	Gas
99		" " #2	32-49-33	921	856	125	796	396	525	Gas
100		" " #3	32-49-33	933	539	129	804	426	507	Dry
101		" " #4	32-49-33	890	500	103	787	360	530	Gas
102		" " #5	32-49-33	916	494	123	793	388	528	Gas
103		" " #6	32-49-33	922	488	127	785	388	534	Aband. Gas
104		" " #7	32-49-33	936	525	155	781	408 E	528 E	Dry
105		" " #8	32-49-33	919	435	118	801	386	533 E	Gas
106		" " #9	32-49-33	923	552	155	768	410 E	513 E	Dry
109		Dr. Sam H. Roberts	32-49-33	903	947	119	784	379	524	Dry
110		W. C. Hodgins	35-49-33	876	312	50	826	307½	568½	Dry
111		Hydraulic Pressed Brick Co.	35-49-33	768	631			198	570	Dry
113		Shanks	35-49-33	757	186					Dry
114		Grover Gaugh #1	36-49-33	803	233			232	571	Gas
115		" " #2	36-49-33	805	426			241	564	Dry
116		L. H. Kurz	36-49-33	919	410	77	842	320½	598½	Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
			T.50, R. 29							
1		Litt Offitt #3	7-50-29	722	178			51	671	Water
			T. 50,R. 30							
1		Frank Myers	7-50-30	923	95	30	893			Water
2		J. G. Burnley	10-50-30	783	124⅛					Water
3		H. R. Foley	11-50-30	812	475			127	685	Water
5	Martin and Reiser	Anne Perrin	17-50-30	772	4200			144?	628	Dry hol
6	McCormick & Breuer	J.W. Denton #1	18-50-30							
7		J.W. Denton #1	18-50-30							
8		J.W. Denton #2	18-50-30	859	234			213	646	Dry hol
9		J.W. Denton #3	18-50-30	869	172					Dry hol
10		J.W. Denton #4	18-50-30	873	207					Dry hol
12		Robert Webb	19-50-30	785	60					
13	Wiley	Bob Blackburn	22-50-30	795	1068			189	606	Dry hol
14		Chris Harra	26-50-30	791	220			109 ±	682 ±	Water
22	J.D. Judd & Co.	Robt. Baker	31-50-30	742	560					Dry hol

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
			T.50-R. 31							
2	Morris Brothers	Barnes #2	11-50-31	728	168			162	566	Dry hole
3		V.M.C.A. Camp	11-50-31	873	322	73	800	318	555	Water
4		Erni	14-50-31	914	326	77	846	323	591	Gas
7	W. O. Porter, et al.	Triplett	19-50-31	919	1481	84	835	316	603	Dry hole
8		J. H. Lentz	21-50-31	937	207	100	837			Water
9	J. W. Scafe	Fred Rogers (McCune Home)	21-50-31	889	400	43	846	296	593	Dry hole
10	J. S. Holmes	S.C. Crooks # 1	23-50-31	769	556			186	583	Dry hole
11	J. D. Judd & Co.	S. C. Crooks # 1	23-50-31	819	479			238	581	Dry hole
12		Porter Stone	23-50-31	828	173½	1	827			Dry hole
13	J. D. Judd & Co.	Thompson # 1	25-50-31	874	481			252	622	Abnd. gas
14		Roger T. Sermon	29-50-31	953	350	103	850			Abandoned
17	Indep. Nat. Gas Co.	Butcher	31-50-31	842	327			222	620	Abandoned
18		Chas. Davidson	31-50-31	897	249	117	780			Water
N			T.50-R.32							
2	Massie Bros.	Julian Farm	13-50-32	734	294			160	574	Water
3	James E. Brusha	Wm. Bessemer #1	23-50-32	928	625	104	824	338	590	Abnd. gas

Addenda
T. 50 - R. 30-31-32

Map No. of Loc.	Company or Owner	Farm	Location	Surface Elev.	Total Depth	Depth Top B. F.	Elev. Top B. F.	Depth Base My. Sta.	Elev. Base My. Sta.	Type of Well
			R. 30							
24		Ed Smith	19-50-30	881	309	19	862	303	578	Water
25	Rex Hedrick Mlng. Co.	Backner Elevator	23-50-30	749	290	---	---	90	659	Water
			R. 31							
22		Wm. Westmoreland	14-50-31	881	173	65	816	---	563 E	Water
25		Bob Moran	27-50-31	885	102	45	840	---	592 E	Water
23	E. O. Wells	Wells Garage	29-50-31	888	51	---	---	---	596 E	Water
26		R. C. Enloe	31-50-31	850	152	---	---	---	593 E	Water
24	Compton, Ranson& Noble	Fields	34-50-31	882	619	14	868	284	598	Dry
			R. 32							
54	Johenda	Swope	25-50-32							
53	"	Dickinson	35-50-32							

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
5		Wm. Bessemer # 3	23-50-32	830	345	8	822	237	593	Dry
5A		Wm. Bessemer #4	23-50-32	888	270	57	831			Gas
8	Indep. Nat. Gas Co.	Bosier	26-50-32	890	190	49	841			Gas
9	Indep. Nat. Gas Co.	Elser- (Wilkie)	26-50-32	901	212	62	839			Gas
9A	James E. Brusha	#1 J.C. Girls Home	26-50-32	931	291	70	861			Gas
10	James E. Brusha	#3 J.D. Girls Home	26-50-32	951	305	86	865			Gas
38	Indep. Nat. Gas Co.	# 8 J.C. Girls Home	26-50-32	939	360	104	835			Dry
39	Indep. Nat. Gas. Co.	#9 J.C. Girls Home	26-50-32	938	239	109	829			Dry
11	Indep. Nat. Gas. Co.	#10 J.C. Girls Home	26-50-32	928	885	68	860	319 E	609 E	
12	James Brusha	Polk Stewart # 1	26-50-32	909	755	45	864	298	611	Gas
13	James Brusha	Polk Stewart # 2	26-50-32	880	237	27	853			Gas
14	James E. Brusha	Polk Stewart #3	26-50-32	865	230	17	848			Dry
16	Indep. Nat. Gas Co.	Stewart # 1	26-50-32	847	216	10	837			Gas
17	Indep. Nat. Gas. Co.	Stewart # 3	26-50-32	858	368	14	844	262	596	Dry
52	James E. Brusha	E. S. Taylor	26-50-32	868	375	35	833	282	586	Dry
18	Indep. Nat. Gas Co.	Walbridge #4	26-50-32	902	286	44	858			Dry
19	Indep. Nat. Gas Co.	Walbridge #5	26-50-32	894	260	43	851			Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
20	James E. Brusha	Borgman # 1	27-50-32	831	636	16	815	261	570	Dry
21	W. O. Porter	Borgman Hrs. #1	27-50-32	866	831	52	814	291	575	Dry
22		H. L. McElroy	28-50-32	908	1205					Dry
23	Mo.Valley Gas & Oil Co.	H. L. McElroy #1	28-50-32	932	435	106	826	357	575	Gas
24	Mo.Valley Gas & Oil Co.	H. L. McElroy #2	28-50-32	889	560			294	595	Dry
25	J. D. Judd	W. C. Roberts	31-50-32	733	470			207	526	Dry
26		Paxton	34-50-32	991	1097	163	828	401	590	Dry
27	Mo.Valley Gas & O. Co.	J. H. Twyman	34-50-32	772	300			182	590	Dry
28	Indep. Nat. Gas Co.	Borders	35-50-32	977	569	139	838	381	596	Abandoned
29	Indep. Nat. Gas Co.	Culp # 1	35-50-32	893	231	60	833			Abandoned
30	Indep. Nat. Gas Co.	Culp # 2	35-50-32	926	241	77	842			Abandoned
31	Indep. Nat. Gas Co.	Dickinson # 1	35-50-32	947	279	88	859			Dry
32	Indep. Nat. Gas Co.	Dickinson # 2	35-50-32	979	281	128	851			Aband.
34	James E. Brusha	John Evans	35-50-32	948	315	102	846			Dry hole
35		Henley & Cooley	35-50-32	997	585	154	843	400	597	Gas
36	James E. Brusha	J.C. Girls Home #2	35-50-32	965	325	105	860			Gas
37	Indep. Nat. Gas Co.	J.C. Girls Home #7	35-50-32	965	250	114	851			Gas

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
40		John Linnburg	35-50-32	963	296	120	843			Gas
41		W. E. Moore	35-50-32	997	466	168	829	411	586	Dry hole
42	James E. Brusha	W. H. Nelson	35-50-32	932	335	83	849	328	604	Dry hole
43	Indep. Nat. Gas Co.	Proctor	35-50-32	946	308	105	841			Gas
44		Voile Sanitarium #2	3 5-50-32	951	640	118	833			Gas
47	Indep. Nat. Gas Co.	Cragshall	36-50-32	1017	360	173	844			Dry hole
48		Dimoush	36-50-32	1007	499	171	836	415	592	Gas
49		Dimoush # 2	36-50-32	964	533	127	837	370	594	Gas
50	Indep. Nat. Gas Co.	Harvey	36-50-32	961	245	97	864			Gas
51	James E. Brusha	J. P. Liddle	36-50-32	1002	500	154	848	400	602	Dry hole
1			T-50-R.33							
1	K.C. Water Commission	# 5	23-50-33	739	245			207	532	Test
4		Meriweather & Knoche	25-50-33	735 -	743			209	526	Dry
8		K. C. Macaroni	32-50-33	846	670	105	741	368	478	Dry
9		K.C. ShowCase Co. #1	32-50-33	792	715			307	485	Dry
10		K.C. ShowCase Co. #2	32-50-33	805	442			339	466	Dry
15		U.S. Cold Storage #1	32-50-33	810	437	60	750	327	483	Dry

Map No. of Well	Company	Farm	Location	Surf. Elev.	Total Depth	Depth top B.F.	Elev. top B.F.	Depth base Lex. Cap	Elev. base Lex. Cap	Type of Well
16		U.S. Cold Storage #2	32-50-33	787	420	50	737	303	484	Dry
18		Brown & Strauss	33-50-33	744	516			243	501	Dry
19		Forest Dairy Co.	33-50-33	839	700			360	479	Dry
22		K.C. Smelting Co.	33-50-33	741	450			235 E	506 E	Dry
23		John Lusco	33-50-33	973	875	220	753	473	500	Dry
24		Washburn-Crosby	34-50-33	739	600			229	510	dry
25		Belmont Theater	35-50-33	810	700	42	768	295	515	Water
26		Sheffield Steel Co.	36-50-33	738	505			175	563	Dry
			T.51-R.30							
2		Henry Morris	32-51-30	850	256			204	646	Water
3		Harry Knale	33-51-30	807	196			184	623	Water

APPENDIX II

Map		Plate
I	Structure Map of Jackson County Datum top Bethany Falls Limestone	I
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III	Structure Map of Blue Ridge Gas Field Datum top Bethany Falls Limestone	III
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V	Structure Map of Blue Ridge Gas Field Datum top of Burbank Shoe-string Sand	V
	Geologic Structure Section A-A	VI
	B-B	VII
	C-C	VIII